danger, a detached rocky patch which dries 3 feet, lies about 4 1/4 miles west-southwestward of Money Point.

Numerous rocks and shoals also front the south coast of the promontory at distances up to 1 1/4 miles offshore. The outermost of these dangers are a rock, which dries 4 feet, about 1 1/2 miles southwestward and a rock, 6 feet high, about 3/4 mile south-southeastward, respectively, of Mawyon Pagoda; KYAUKCHINHMAW (Remarkable Rock), a conspicuous rock 30 feet high, lies about 2 1/2 miles east-southeastward of the pagoda.

Padaung Islet lies on foul ground close to the shore about 2 1/2 miles eastward of Kyaukchinhmaw.

The shallow Kamyit and Salu Rivers (Chaungs) enter the sea between Padaung Islet and Bluff Cape.

BLUFF CAPE, located about 15 1/2 miles south-southeastward of Mawyon Pagoda, rises steeply from the sea to an elevation of 450 feet and is a fairly conspicuous landmark. About 2 miles eastward of the cape is the entrance of the Kyeintali River (Chaung), which is navigable by boats.

Between Bluff Cape and Gwa Bay, which lies about 24 miles south-southeastward of Bluff Cape, several hills and peaks rise near the coast and are easily identified from seaward. TAUNGNE LA (North Sharp Peak), 3,760 feet high, is located about 12 1/2 miles eastward of Bluff Cape. KUNGYAUNG TAUNG (South Sharp Peak) rises to an elevation of 2,320 feet about 14 miles southeastward of Bluff Cape. HIGH PEAK, 12 miles south-southeastward of Bluff Cape, is 1,920 feet high; TAUNGLUN TAUNG (Quoin Hill) 830 feet high, is nearly 4 miles southward of High Peak and Button Hill, 409 feet high, is 3 miles southward of Taunglun Taung.

The Satthwa Chaung (Hswathwa River) entrance, about 14 miles southward of Bluff Cape, is nearly closed by reefs. A passage exists through the reefs and over the shallow bar from the southward close to shore and leads to the village of Satthwa (Hswathwa) just within the entrance.

An area of foul ground, marked by numerous drying rocks, extends about 2 1/2 miles southwestward from the entrance of the Satthwa Chaung. About 3/4 mile westward of the outer edge of the foul ground is a rocky 5-fathom patch.

Considerably less water than charted was reported in 1935 in the vicinity of a position about 5 miles south-southwestward of Bluff Cape.

Numerous dangers lie inside the 10-fathom curve between Bluff Cape and the entrance of Gwa Bay. The outermost danger, a shoal patch which dries 2 feet, lies about 2 miles offshore and about 7 1/4 miles southward of Bluff Cape.

GWA BAY (17°37'N., 94°34'E.)

5B-26 The entrance of Gwa Bay lies between an extremity, 206 feet high, about 5 miles southward of Button Hill and a point 2 miles farther southward. The latter point on the south side of the bay is the extremity of a promontory extending northward between the sea and the Gwa Chaung (River).

A reef extends about 3/4 mile westward and 1/2 mile south-southwestward from the extremity on the north side of the entrance. A detached reef, which dries 5 feet, lies 1 3/4 miles westward of the point on the south side of the entrance. Another detached reef, which dries 3 feet, lies 1/2 mile south-southwestward of the above mentioned reef.

Gwa Kyun, 144 feet high, is located about 2 3/4 miles west-southwestward of the point on the south side of the entrance. The island serves as an excellent landmark. Depths of less than 3 fathoms lie off the west side of the reef-fringed island. Foul ground and depths of less than 3 fathoms lie between the shore of the mainland and Gwa Kyun; local knowledge is required to navigate the channel between the island and the mainland.

ANCHORAGE.—Gwa Bay affords anchorage in 4 to 6 fathoms, but is exposed to westerly winds.

GWA.—The Gwa Chaung flows into the south side of the bay. The entrance of the river, about 3/4 mile east-southeastward of the point on the south side of the entrance of the bay, is fronted by a bar of sand with a least depth of 7 feet.

During the Northeast Monsoon, steamers

call occasionally at the village of Gwa, which is situated on the east side of the entrance of the river. The village has post and telegraph offices and a hospital.

COASTAL FEATURES—LANDMARKS (CONTINUED)

5B-27 The coast between Gwa Bay and BROKEN POINT (16°55'N., 94°23'E.) is rocky and indented by several small bays, which afford anchorage in fine weather, but with the exception of Danson Bay, give little shelter during the Southwest Monsoon.

Depths of 2 3/4 and 3 fathoms are charted between 1 1/4 and 2 miles southward of the south end of Gwa Kyun and lie about 2 miles off the coast of the mainland. A rock, which dries 2 feet, lies within these shoal depths. Other than the above dangers, the outermost danger charted between Gwa Kyun and Bawmi (Bomie) Bay is a detached rock which dries 5 feet and lies 1 1/4 miles offshore, about midway between Gwa Kyun and Bawmi Bay.

Bawmi Bay is entered about 16 miles southward of Gwa Bay. The Bawmi Chaung, navigable by boats, flows into the head of the bay.

PANTAMAW (Pontamau) ISLAND (17°19'N., 94°30'E.), 180 feet high and reef-fringed, lies close northward of a small peninsula about 3 miles west-southwestward of Bawmi Bay. Myauk Islet, 55 feet high, lies about 1/2 mile northeastward of Pantamaw Island. Shoal depths surround the latter island; foul ground lies between the mainland and Pantamaw Island and between the latter island and Myauk Islet.

HTAN DAUNG (Round Hill), 637 feet high, and AHTUGYI TAUNG (Thumb Hill), 780 feet high, are located 5 1/4 and 8 miles south-southeastward, respectively, of Pantamaw Island. These conspicuous hills rise about 2 miles inland of the east shore of Danson Bay and form excellent landmarks.

Rocks and reefs fringe the steep-to coast southward of Pantamaw Island to the entrance of Danson Bay.

DANSON BAY is entered about 6 miles south-southwestward of Pantamaw Island, and unlike other bays indenting the coast between Cheduba Strait and Cape Negrais, is well sheltered from southerly and southwesterly winds. Foul ground, on which there are numerous rocks, extends westward for about 3 1/2 miles from the southwest entrance point of Danson Bay, located 7 1/2 miles south-southwestward of Pantamaw Island. West Sandy Islet, 15 feet high, lies on this foul ground, about 1 3/4 miles westward of the southwest entrance point. Within the bay, foul ground and shoal depths of less than 3 fathoms front the shores of the bay up to nearly 1 1/4 miles.

ANCHORAGE for large vessels may be obtained in Danson Bay in depths of 5 to 6 fathoms with Htan Daung bearing 056° and Ahtugyi Taung bearing 098°. The anchorage is sheltered except from the northwestward. Entering vessels should give West Sandy Islet a wide berth, keeping about 2 miles to the northward of the islet.

Chaungtha Kyun (High Island), 130 feet high, lies off the entrance of the Kyaungtha River (Chaungtha Chaung) and is located about 14 miles southward of West Sandy Islet and about 3 miles northeastward of Broken Point. Thebyu Kyun (Sandy Island), 64 feet high, lies about 1 mile north-northwestward of Chaungtha Kyun Rocks and foul ground extend about 2 1/4 miles northwestward from Thebyu Kyun. Several reefs lie off the entrance of the Kyaungtha River. A heavy swell breaks on the entrance bar, except in fine weather. The Kyaungtha is navigable by boats, which should pass northward of Chaungtha Kyun when entering. Kyaungtha village is situated on the north bank of the river, close within its entrance.

5B-28 Between Broken Point and Goyangyi Kyun (Koronge Island), located about 24 miles south-southwestward of Broken Point, the coast is rocky and irregular. Several islands and reefs lie within 3 miles of this section of the coast.

The Thitpok River enters the sea about 11 miles southward of Broken Point. Sinma Kyungyi (Round Island), 130 feet high, lies about 3/4 mile northward of the entrance and about 1/2 mile offshore. Boats navigate the

Thitpok River; the bar at the entrance can be crossed only at high water. Boats entering the river should pass northward and eastward of Sinma Kyungyi to avoid St. Mary Rock, nearly 1/2 mile west-southwestward of Sinma Kyungyi, and other rocks about 1/2 mile westward of the entrance. Sinma (Hsengma) is a large village situated on the north bank of the river close within the entrance.

VIBART SHOAL, with a least depth of 2 1/2 fathoms, sand and rocks, lies about 2 3/4 miles southwestward of Sinma Kyungyi.

MIGYAUNGGAUNG (Alligator Head) (16° 36'N., 94°19'E.) is the south extremity of a large, rocky, promontory about 19 miles southward of Broken Point. When observed from seaward it resembles an alligator's head facing southward. NGAYOK TAUNG, a peak 1,317 feet high and one of the most conspicuous peaks on this coast, rises about 6 1/4 miles southeastward of Alligator Head.

GAHTI KYAUK (Milestone Rock), a lone rock 40 feet high and steep-to, lies about 4 1/2 miles north-northwestward of Migyaunggaung and about the same distance westward of the coast.

Thebyu Kyun (Little Quoin Island), 130 feet high, lies about 3 1/2 miles north-northeastward of Migyaunggaung and about 1 3/4 miles offshore.

Myingyi Kyun (High Island) lies nearly 2 miles northwestward of Migyaunggaung. North Reef, South Reef, and West Reef lie about 1 mile northward, southward, and westward, respectively, of High Island. Migyaunggaung Kyun (Saba Island) lies between South Reef and Migyaunggaung.

Ngayok Bay, an indentation between Migyaunggaung and the north end of Goyangyi Kyun, about 5 miles southwest of Migyaunggaung, affords little protection except from the southward. Large vessels should not enter the bay because of the many dangers lying within it. The Ngayok Chaung, a river navigable by boats, empties into the south part of the bay.

With the exception of the Calventuras (sec. 5B-5), Vibart Shoal, and Gahti Kyauk, which lie outside the 10-fathom curve, all the islands and dangers lie inside the 10-fathom curve between Broken Point and Goyangyi Kyun. Several 9- and 10-fathom patches lie outside the 10-fathom curve; the positions of these may be found on the chart.

5B-29 GOYANGYI KYUN (Koronge Island) (16°32'N., 94°15'E.), 265 feet high and rugged in appearance, is wedge-shaped and rocky. North Rock lies close off the north end and West Rock lies close off the south end of the island. Depths of 1 1/2 and 2 1/2 fathoms are charted about 1/2 mile southward and southwestward, respectively, of the south end of Goyangyi Kyun. Patches with depths of 7 to 10 fathoms lie outside the 10-fathom curve in the vicinity westward of Goyangyi Kyun.

The channel between Goyangyi Kyun and the mainland is obstructed by reefs and foul ground. Boats can pass through by keeping to the island side of the channel.

ANCHORAGE.—Good anchorage, protected from the northward and northwestward, may be obtained in depths of about 6 fathoms, sand, between the south end of Goyangyi Kyun and the mainland. The anchorage should be approached cautiously so as to avoid Crawford Shoal (sec. 5B-30) and a rock which dries 2 feet and lies about 1 mile southeastward of the south end of Goyangyi Kyun.

5B-30 BETWEEN GOYANGYI KYUN AND CAPE NEGRAIS (16°03'N., 94°12'E.), a distance of 29 miles, numerous small indentations predominate the rock-fringed coast.

ROUND CAPE, 340 feet high, thickly wooded, and conspicuous, is located about midway between Goyangyi Kyun and Cape Negrais. Conspicuous from all directions, CONICAL (YOTPA) MOUNT, 736 feet high and cone shaped, rises about 4 miles southeastward of Round Cape. SPIKE HILL, 7 1/2 miles northeastward of Round Cape, has an elevation of 850 feet. FAT HILL, 4 miles northeastward of Cape Negrais, is 650 feet high. Conical Mount, Spike Hill, and Fat Hill comprise the most conspicuous peaks between Goyangyi Kyun and Cape Negrais.

Crawford Shoal, a group of rocks which dries 4 feet, lie nearly 3 miles southwestward of Goyangyi Kyun. A spit with a depth of

3 fathoms at its outer end extends about 1/2 mile southward from Crawford Shoal; depths of 6 to 13 fathoms surround the shoal and spit.

White Rock, which dries 5 feet, lies about 2 1/4 miles south-southeastward of Goyangyi Kyun and about 3/4 mile offshore.

Megaunggan Kyun (May Gaumgaun), 65 feet high, Ongyun Kyun (Ung Chune Island), 175 feet high, and Leik Kyun (Lichune Island), 120 feet high, form a group of islands which lie between 6 and 9 miles southward of Goyangyi Kyun and about 1 mile to 2 miles offshore. Rocks, foul ground, and shoal depths fringe the three islands. Patches with depths of 2 3/4 and 3 fathoms lie between positions about 1 mile west-southwestward and 1 3/4 miles southwestward of Megaunggan Kyun.

A rock, 11 feet high, lies on the south edge of a shoal area about 1/2 mile southwestward of Leik Kyun. A depth of 1 3/4 fathoms is charted at the outer end of the shoal, nearly 3/4 mile north-northeastward of the rock.

Saingbain Kieu (Buffaloes), a group of conspicuous, large detached rocks, some of which appear white, parallel the coast for a distance of 3 miles about 2 1/2 miles offshore. North Twin, 42 feet high and the northernmost rock, lies about 6 miles north-northwestward of Round Cape. South Rock, 38 feet high, the southernmost of the group, lies about 4 miles northwestward of Round Cape. Pillar Rock, 43 feet high, is located about 1/2 mile south-southwestward of North Twin. Sunken rocks and depths of 3 fathoms and less lie up to about 1 1/4 miles off the coast between the Saingbain Kieu and the mainland. Numerous shoal patches, with depths of 3 1/4 to 5 fathoms lie between South Rock and Round Cape.

Mushroom Rock, 9 feet high, lies about 2 miles northward of Round Cape and about 1 mile offshore.

Black Rock, 4 feet high and dark-colored, lies about 4 1/2 miles southwestward of Round Cape and about 2 miles offshore.

A 10-fathom shoal and a 6 1/4-fathom shoal lie about 5 3/4 miles west-northwestward and 5 1/2 miles westward, respectively, of Cape Negrais.

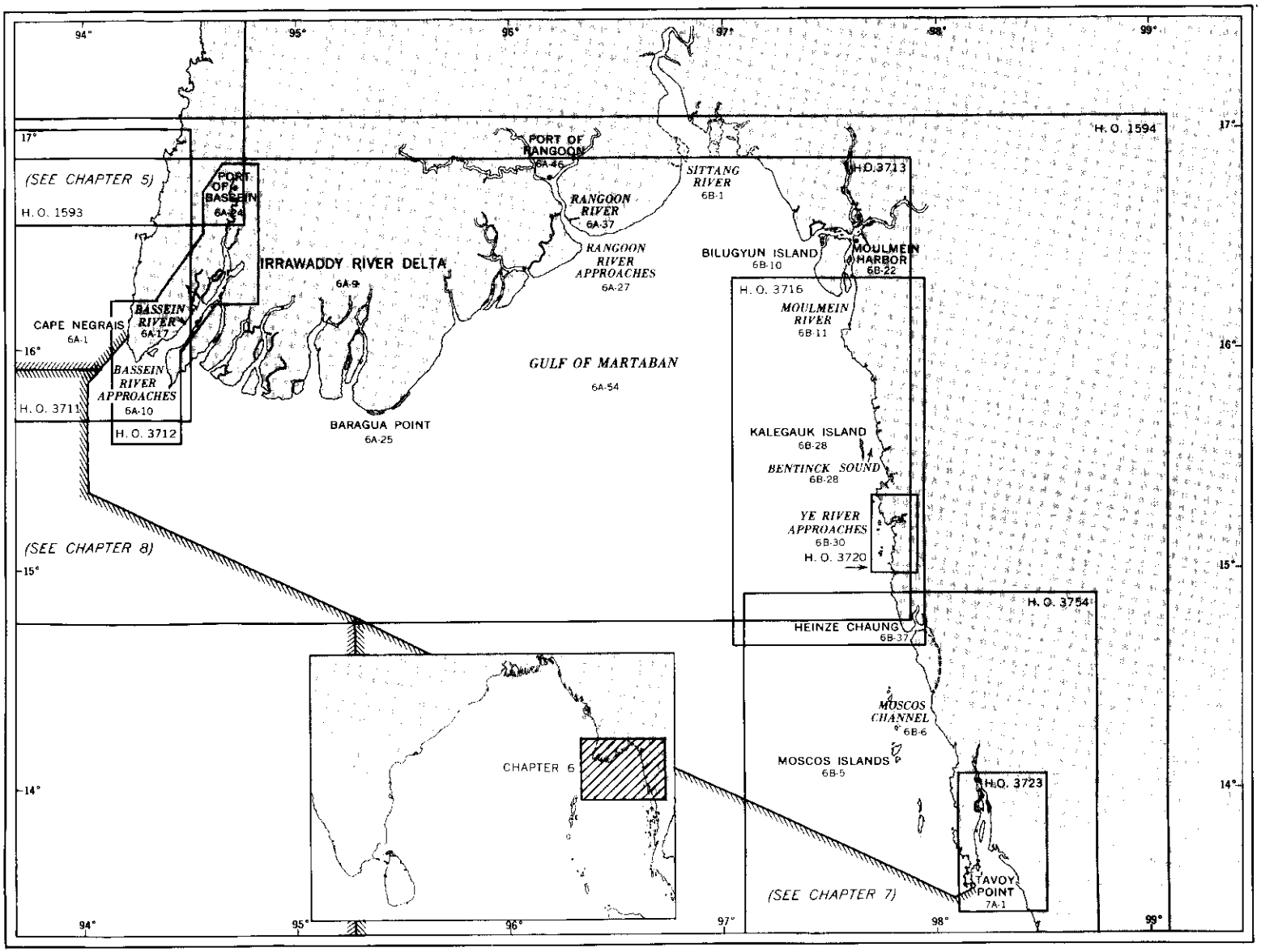


Chart limits shown are of the best scale charts issued to naval vessels by the U. S. Naval Oceanographic Office.
Numbers refer to the section in the text describing a designated locality.

CHAPTER 6—GRAPHIC INDEX

222-679 O - 68 - 17

CHAPTER 6

COAST OF BURMA, CAPE NEGRAIS TO THE TAVOY RIVER INCLUDING THE IRRAWADDY RIVER DELTA AND THE GULF OF MARTABAN

Part A. Cape Negrais to the Sittang River
Part B. Sittang River to the Tavoy River

PLAN.—This chapter deals with the coast of Burma and the three ranking seaports in that country, namely Rangoon, Bassein, and Moulmein. From Cape Negrais to the entrance of the Sittang River the progression is from west to east, thence southward to the Tavoy River.

GENERAL REMARKS

6-1 Between Cape Negrais and the Sittang River the Irrawaddy Coast, the rivers Bassein and Rangoon, and the ports of Bassein and Rangoon are described. Thence follows a description of the Tenasserim Coast as far southward as the Tavoy River and includes the port of Moulmein, Bentinck Sound, the Ye River, Heinze Chaung, and the off-lying Moscos Islands.

Flats extend southward from the low Irrawaddy Delta Coast. Hills and mountain ranges, some with conspicuous summits, parallel and back the Tenasserim Coast at various distances inland. In places, islands, shoals, and sands lie off of and front this coast, which for the most part is steep-to.

Bentinck Sound affords some shelter.

NAVIGATION

6-2 Navigation offshore of and along the Irrawaddy and Tenasserim Coasts of Burma may be as direct and close to shore as safe navigation will permit.

Ocean routes to the port of Rangoon are outlined on the Route Chart which accompanies this volume.

Navigational warnings are broadcast from Rangoon. See H.O. Pub. 117B.

WINDS—WEATHER

6-3 See section 5-3 for the weather and climate of Burma.

CURRENTS—TIDAL CURRENTS

6-4 The current westward of the entrance of the Irrawaddy River is irregular in the fine weather season and varies with the direction of the wind. Here the current has no apparent connection with the rise and fall of the tide. See also section 5-4 for a discussion of offshore currents.

During November, December, and Janauary little or no flood current is observed southward of Alguada Reefs, except at springs.

PART A. CAPE NEGRAIS TO THE SITTANG RIVER

6A-1 CAPE NEGRAIS (16°02'N., 94°12'E.) is the extremity of a spur of the Arakan Yoma Range. Conspicuous cliffs rise steeply from the sea to a summit, 410 feet high, about 3/4 mile inland of the cape.

COAST—GENERAL

6A-2 The coast of the Irrawaddy Delta is low for its entire length which lies between the Bassein River and the Sittang River. The only high ground close along the coast is that which rises on the west side of the mouth of the Bassein River; here the south extremity of the Arakan Yoma Range terminates in the vicinity of Maw Dengi (Pagoda Point). Between the Bassein River and the China Bakir River there are no landmarks and the navigational aids are few in number.

DEPTHS—DANGERS

6A-3 Between positions southward of Purian Point (sec. 6A-10) and Baragua Point (sec. 6A-25) the 10-fathom curve is charted about 10 to 20 miles offshore. The 6-fathom curve roughly parallels the 10-fathom curve at distances of about 2 to 8 miles within the latter curve. Shoal depths of 3 fathoms

and less lie between the 6-fathom curve and the shore.

Depths of 8 fathoms have been reported in the vicinity of approximately 15°30'N., 94° 51'E.

The 10-fathom curve lies about 18 miles southeastward and 21 miles eastward, respectively, of Baragua Point, thence it is charted eastward to the vicinity of Kalegauk Island (sec. 6B-28) and approximates the outer limits of the Gulf of Martaban.

Southeastward to eastward of Baragua Point the 6-fathom curve lies only about 1 mile to 2 miles within the 10-fathom curve, thence it is defined east-northeastward at distances of 8 to 30 miles offshore.

Depths and dangers within the 6-fathom curve are discussed elsewhere in this chapter along with the coastal features and the approaches to the Rangoon River.

OFF-LYING DANGERS

6A-4 A shoal with a depth of 5 fathoms was reported to lie in approximate position 15°43'N., 96°14'E., about 46 miles southward of Elephant Point.

Dangerous sunken WRECKS lie in approximate positions 15°52'N., 96°21'E. and 15° 50'N., 96°24'E., about 36 and 38 miles southward, respectively, of Elephant Point. A March 1962 report states these wrecks were removed; caution is still advised.

NAVIGATION

6A-5 Vessels should not approach the coast within a distance of 3 miles in the vicinity of Cape Negrais. A fringing reef and off-lying rocks make caution advisable even outside this distance.

The shallow bank which fronts the delta shore between Purian Point and Baragua Point should not be approached by vessels closer than in depths of 10 fathoms.

Directions for vessels approaching the entrance of the Rangoon River are given in section 6A-36.

TIDES—TIDAL CURRENTS

6A-6 See section 6A-11 and 6A-30.

WINDS—WEATHER

6A-7 See section 5-3.

COASTAL FEATURES—LANDMARKS

6A-8 BETWEEN CAPE NEGRAIS AND MAW DENGI, a point located about 6 miles south-southeastward of Cape Negrais, a succession of low hills, most of them densely wooded, mark the coast. Towards Maw Dengi, these hills have some conspicuous, reddish slopes of blown sand which leave well-defined edges of dark foliage near their summits.

The coast between Cape Negrais and Maw Dengi is rocky and reef-fringed. Detached rocky shoal patches with depths of less than 3 fathoms and sunken rocks lie up to about 3/4 mile offshore along this stretch of the coast.

Detached reefs, which dry 6 and 8 feet, a rock 2 feet high, sunken rocks, and shoal patches with depths of 3 fathoms lie in a line up to about 1 1/2 miles offshore with the outer danger about 2 1/4 miles southward of Cape Negrais.

MAW DENGI (Pagoda Point) (15°57'N., 94° 15'E.) about 100 feet high and flat, terminates in a bluff with somewhat bare sides, the southwest side being the steepest. A PAGODA, with an elevation of 144 feet, stands on the point and is visible above the trees.

Depths of 3 fathoms and less, rocky bottom, lie up to about 1/2 mile off Maw Dengi, southward through southwestward to westward. A rocky patch with a depth of 3 fathoms lies about 1 mile westward of the point.

THE IRRAWADDY RIVER DELTA

6A-9 THE IRRAWADDY RIVER rises in the northern part of Burma and flows generally southward. Augmented by numerous tributaries, the Irrawaddy flows into the Bay of Bengal by way of several channels through an extensive delta lying approximately between the meridians of 94°15'E. and 96° 50'E. This delta is being constantly extended seaward by the deposit of silt. Many low islands are formed near its seaward extremity by tidal backwaters and smaller cross channels which connect with the main channels.

The only channels through the Irrawaddy Delta used by ocean vessels are the Bassein River and the Rangoon River, the westernmost and easternmost, respectively.

APPROACHES TO THE BASSEIN RIVER

6A-10 MAW DENGI (Pagoda Point), located on the northwest side of the entrance of the Bassein River, is discussed in section 6A-8.

PURIAN POINT (15°50'N., 94°24'E.) about 11 miles southeastward of Maw Dengi, is the south end of an extremity of the Irrawaddy Delta located on the southeast side of the entrance of the Bassein River. A group of trees, 75 feet high, and to the northward, shows above Purian Point, which lies low. White-sandstone bluffs, 10 feet high, extend 1 1/2 miles northeastward from the point. On the west side of the extremity, bluffs, 30 to 45 feet high, begin about 1 mile north-northeastward of Purian Point and extend northward for about 1 1/4 miles terminating in jungle growth.

TIDES—TIDAL CURRENTS

6A-11 Tides in the entrance of the Bassein River are semidiurnal.

TIDAL HEIGHTS ABOVE *H.O. CHART DATUM.—Diamond Island: MHWS 7.7 feet, MLWS 1.5 feet; MHWN 6.0 feet, MLWN 3.3 feet. *H.O. Charts 3711, 3712.

The tidal currents set strongly across Phaeton Shoals, the flood current sets eastward and the ebb current sets westward.

One mile northward of Diamond Island the tidal currents are rotary during spring tides. At the beginning of the flood tide the current sets 152° and changes through 090° so that at the end of the flood it sets about 057°. With the commencement of the ebb tide, the current sets about 315° and changes through 270° setting at the end about 225°. The greatest velocity, 1 1/2 knots, is attained during the second and third quarters of each tide.

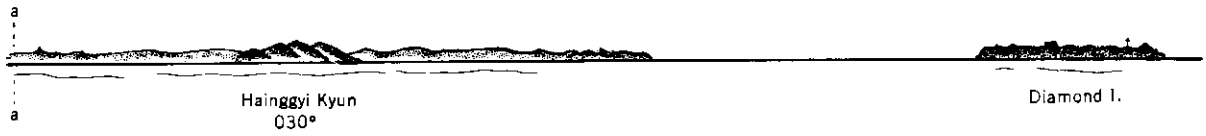
Near the entrance bar the flood current sets about eastward and the ebb current sets between southwestward and south-southwestward at velocities of 1 1/2 to 3 1/2 knots during spring tides. At spring tides during the rainy season the ebb current may reach a velocity of 6 knots.

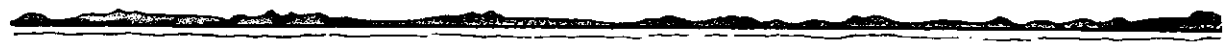
DEPTHS—DANGERS

6A-12 Alguada Reefs, Hugh Rose Rock, and Phaeton Shoals lie south-southwestward of the entrance of the Bassein River. These dangers, with the exception of Phaeton Shoals, are discussed in section 8A-2.

BASSEIN RIVER ENTRANCE

From a position westward of Phaeton Shoals





BASSEIN RIVER ENTRANCE

From position eastward of Phaeton Shoals

PHAETON SHOALS, about 3 miles in extent, lie between positions about 4 and 7 miles south-southwestward of Diamond Island (Thamihla Kyun) Light Structure (sec. 6A-13). The shoals consist of numerous rocky patches with depths of 2 1/4 to 5 fathoms. Depths of 6 to 10 fathoms surround the shoals.

DIAMOND ISLAND (Thamihla Kyun) (15° 52'N., 94°17'E.), flat and wooded, is located close off the middle of the mouth of the river and about 5 1/2 miles south-southeastward of Maw Dengi. Reefs and shoals fringe the island and in places extend nearly 1/2 mile offshore. Foul ground and reefs, some of which dry 8 feet, extend about 2 1/2 miles south-southwestward from the south side of the island. Rocky patches, with depths of 4 1/2 fathoms, lie nearly 1 mile westward of Diamond Island.

BARONI ROCK, with a depth of 2 3/4 fathoms, lies about 1/2 mile northeastward of the north end of Diamond Island. Depths of 3 1/2 and 3 3/4 fathoms lie nearly 1/4 and 1/2 mile northward and northeastward, respectively, of Baroni Rock.

ORESTES SHOAL, with depths of 3 fathoms, lies in the entrance of the river about midway between Diamond Island and Maw Dengi, being about 3 miles south-southeastward of the latter.

Depths in the channel between Diamond Island and Purian Bank (sec. 6A-21) to the east-northeastward of Diamond Island range from 3 1/4 to 5 1/4 fathoms. Depths in the approach westward of Diamond Island range from 4 1/4 to 10 fathoms.

The 10-fathom curve is charted about 6 miles southwestward of Maw Dengi and about 5 1/2 and 10 miles southwestward and southward, respectively, of Purian Point. Scattered depths of 8 to 10 fathoms are charted eastward of Alguada Reefs and Phaeton Shoals; the chart is the best guide for locating these depths which lie outside the 10-fathom curve.

NAVIGATIONAL AIDS

6A-13 THAMIHLA KYUN LIGHT is shown from the northeast side of Diamond Island.

A LIGHT BUOY is moored about 700 yards north-northeastward of Baroni Rock. During the Northeast Monsoon this light buoy is replaced by an unlighted buoy.

A LIGHT BUOY, moored a little more than 1/2 mile eastward of the light structure on Diamond Island, marks the extremity of a 2 1/2-fathom spit which extends nearly 1/2 mile eastward from the shore of the island.

ANCHORAGE

6A-14 Good anchorage may be obtained about 3/4 mile eastward of Diamond Island in 4 1/2 to 5 fathoms during the Northeast Monsoon. When anchored in this position the summit of Hainggyi Kyun (sec. 6A-21) should bear about 018° and the light structure on Diamond Island about 300°.

Landing in the small bay on the east side of the island can be made during the Northeast Monsoon, but should not be attempted during the Southwest Monsoon.

PILOTAGE—PILOTS

6A-15 Pilotage is compulsory; pilots will board off the pilot station, located about 1/4 mile southeastward of Dalhousie Point (sec. 6A-22).

If the Northeast Monsoon prevails, vessels should proceed to the anchorage eastward of Diamond Island.

To avoid delay, vessel's expected time of arrival at Diamond Island should be sent at least 48 hours in advance to the Port Officer at Bassein.

DIRECTIONS

6A-16 Vessels approaching the entrance of the Bassein River from the southward should not approach Pa-thein (Alguada) Lighthouse (sec. 8A-2) closer than 3 miles. Note that the summit of Hainggyi Kyun, bearing 020°, and well open eastward of Diamond Island leads about 1/2 mile eastward of the easternmost shoal depths of Alguada Reefs and Phaeton Shoals. After passing Phaeton Shoals, vessels should make good a course shaped for the anchorage eastward of Diamond Island. Caution should be exercised to guard against the effect of the tidal current.

Thence by steering 326° for Maw Dengi vessels pass northward of Baroni Rock and

when Pa-thein Lighthouse is open westward of Diamond Island, alter course to the northeastward and enter the river between Orestes Shoal and Purian Bank. Pass westward of Burgess Rock (sec. 6A-21), and not closer than 400 yards.

Vessels approaching the entrance of the river from the westward, if proceeding to the anchorage eastward of Diamond Island, should pass about 1 mile northward of the island so as to clear the shoal depths northward of Baroni Rock. When Pa-thein Lighthouse bears 207° and is well open eastward of Diamond Island, steer for the anchorage. This approach is not recommended during the Southwest Monsoon.

BASSEIN RIVER TO BASSEIN (16°47'N., 94°44'E.)

6A-17 THE BASSEIN RIVER, the westernmost of the channels through the Irrawaddy Delta, is the means of access for ocean vessels calling at the port of Bassein, located about 67 miles above the river's entrance. For the most part, the banks of the river are low and covered with dense jungle.

NAVIGATION

6A-18 The river channel, from its entrance between Maw Dengi and Purian Point, leads northeastward and thence northward to Bassein. The lack of lighted navigational aids makes night navigation impracticable.

Due to the narrowness of the river at Bassein, single-screw vessels exceeding 450 feet LOA and twin-screw vessels exceeding 475 feet LOA are advised against making the port.

Convenient drafts for the port vary between 21 and 26 1/2 feet, with lowest drafts available during March and April.

Deep-draft vessels await high water in order to clear the entrance bar. About 44 miles upriver, high water is again necessary in order to pass over Panmawaddy Flat. Thus successive periods of high water are usually required and the passage in either direction between the port and the entrance ordinarily takes longer than a day.

In heavy weather the best time to cross the entrance bar is between half tide and 2 hours after high water at Diamond Island. During the Southwest Monsoon a clearance of at least 4 feet under the keel is considered necessary when crossing the entrance bar.

WEATHER

6A-19 The weather is hot and humid; most of the rainfall, sometimes over 100 inches annually, occurs during the Southwest Monsoon between June and September.

For a table of meteorological data for Diamond Island in the approach to the entrance of the Bassein River, see the Appendix.

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

The Extended System is in use at Bassein; the port receives information, but signals are not displayed.

TIDES—TIDAL CURRENTS

6A-20 Large diurnal inequalities and seasonal variations best describe the tides at Bassein.

TIDAL HEIGHTS ABOVE *H.O. CHART DATUM.—Bassein: MHWS 8.6 feet, MLWS 2.9 feet; MHWN 7.4 feet, MLWN 3.9 feet. *H.O. Chart 3712.

TIDE GAUGE.—A tide gauge stands on Ashby Rocks near the west bank of the river and just northward of Panmawaddy Flat. A white cage topmark and red, black, and white plaques from the top downward, respectively, mark the tide gauge. Each plaque represents 1 foot; the lower edge of the topmost white plaque marks the 26-foot level.

TIDAL CURRENTS.—Tidal currents at springs attain velocities of 1 1/2 to 2 knots during the flood and up to 3 knots during the ebb and may reach 5 knots when there are freshets.

CHANNELS—DEPTHS—DANGERS—NAVIGATIONAL AIDS

6A-21 The least depth in the channel over the bar which lies across the entrance of the Bassein River is about 20 feet. The bar lies between the shallow flat close eastward of Maw Dengi and the west and southwest edges

of Purian Bank. The channel over the bar leads between Purian Bank on the east and Orestes Shoal on the west.

The controlling depth in the river channel between Diamond Island and Bassein is the depth over Panmawaddy Flat. Silting has reduced the least depth over the flat to 13 feet in the past; in 1964 the channel was dredged to 17 feet.

Changes in the channels are frequent. Navigational aids are meager along the river. There are buoys at only a few positions along the channel between Diamond Island and the port. Knowledge of the various channels, aids, and dangers to navigation is possessed by the local pilots.

NORTHWEST SIDE OF THE ENTRANCE.—A reef, which dries 4 feet, fringes Maw Dengi up to 1/4 mile offshore. An obelisk, 9 feet high, stands on the reef near the southeast extremity of Maw Dengi. Depths of 3 fathoms and less lie up to about 1/2 mile southward of the point and over the shallow flat which lies in the bight between the point and Sand Cay. The latter, a rocky patch 2 feet high, is located about 4 1/2 miles east-northeastward of Maw Dengi.

HAINGGYI KYUN, an island with a 445-foot densely-wooded summit on its northeast extremity, lies close offshore with Rocky Point, its southernmost point, being about 5 miles east-northeastward of Maw Dengi. The island, except for its northeast part, is flat and covered with jungle. A 72-foot tree on Southeast Point, about 1/4 mile north-northeastward of Rocky Point, is a good mark. Good water is obtainable at a fishing village situated on the northeast extremity of the island.

WOLF ROCK, which dries, lies about 1 mile north-northeastward of Rocky Point and about 800 yards off the east shore of Hainggyi Kyun. Foul ground and shoal depths surround the rock and lie up to about 800 yards eastward and southward of it.

A black can buoy is moored on the edge of the 5-fathom curve eastward of Wolf Rock. A red spherical buoy is moored about 600 yards southward of the east extremity of the foul ground which surrounds Wolf Rock.

SOUTHEAST SIDE OF THE ENTRANCE.—The east bank of the river between Purian Point and Ward Point, 10 3/4 miles northward of Purian Point, forms the southeast side of the entrance.

Sunken rocks lie for a distance of 3/4 mile south-southwestward of Purian Point and terminate in a reef which dries 6 feet. Depths of less than 3 fathoms lie up to about 1 mile southeastward and southward of the point.

PURIAN BANK, with depths of 3 fathoms and less, fronts the shore between Purian Point and Ward Point and extends westward up to about 5 3/4 miles offshore. MARTIN ROCKS, 4 feet high, lie on the inner part of Purian Bank about 1 mile northwestward of Purian Point and appear dark and jagged. PURIAN LIGHT BUOY, a black can buoy, is moored about 2 miles southward of Rocky Point.

BURGESS ROCK, with a depth of 3 fathoms, lies about 2 3/4 miles west-southwestward of Ward Point. Depths of 5 fathoms surround the rock and lie southward as far as 600 yards from it. A black can LIGHT BUOY is moored about 1/4 mile northward of Burgess Rock.

RIVER ABOVE HAINGGYI KYUN
ASPECT—LANDMARKS—NAVIGATIONAL AIDS

6A-22 In the following section only a general description covering features, landmarks, distances along the river, and some charted aids are set forth.

Dalhousie (Fytche) Point, on the west bank about 2 1/2 miles northward of Ward Point, is a bluff about 40 feet high. Several pagodas stand on the point.

Long Sand, on the southeast side of the channel with its southwest end about 3 miles east-northeastward of Ward Point, consists of two islands lying on a long, narrow shoal, parts of which dry. There are trees on the islands.

Tazingyun (North and South Travers Islands) lie near the east bank of the river about 4 miles above Long Sand. A drying mud bank connects the islands.

Ridge Channel Light Buoy, painted black, is moored about 1 1/4 miles north-northeastward of the north end of Tazingyun (North Travers Island).

Ransom Reach is about 7 1/2 miles upriver from Tazingyun. Sesostris Rocks lie on the west side of the reach and Khayegon Kyun (Salome Island) and Byangyi Kyun

(Mildred Island) lie on its east side.

Sinswe Kyun (Enterprise Island) lies in the middle of the river about 3 1/2 miles northward of Byangyi Kyun. Alexander Rock, with a depth of 2 1/2 fathoms, lies about 1/2 mile south-southwestward of the south end of Sinswe Kyun. Enterprise Flat extends nearly 1 3/4 miles northward from the north end of Sinswe Kyun. Pariah Rock, with a depth of less than 1 fathom, lies on the north extremity of the flat. A black conical buoy is moored off the northeast side of Pariah Rock.

Amazon Point, on the east bank about 5 1/4 miles northward of Sinswe Kyun, marks the south entrance point of the Panmawaddy River. Panmawaddy Flat, with a least depth of 1 foot, lies with its north end about 1 1/4 miles southwestward of Amazon Point. An extensive shoal, with depths of 3 fathoms and less and parts of which dry, lies adjacent to and southward of Panmawaddy Flat to a position about 1/2 mile northward of Pariah Rock. Sunken rocks, position approximate, and shoal depths of less than 3 fathoms lie northward of Panmawaddy Flat abreast the entrance of the Panmawaddy River. A shoal with depths of less than 1 fathom, position approximate, lies nearly 1/2 mile southwestward of Amazon Point.

Cockatoo Point, on the west bank of the river, is located about 1 3/4 miles northwestward of Amazon Point. Ashby Rocks, marked by a beacon, lie close northward of Cockatoo Point.

Thetke Chaung (Rangoon Creek) on the southeast side of Junction Reach, flows into the Bassein River about 8 1/2 miles above the entrance of the Panmawaddy River. Two conspicuous masts support telegraph wires across its entrance.

QUARANTINE ANCHORAGES

6A-23 Anchorage is afforded about 1 mile eastward of Dalhousie Point in 5 to 5 1/2 fathoms.

Vessels suspected of or infected with yellow fever must anchor off Dalhousie Point, not less than 1/2 mile distant from the low-water line. Vessels with plague or cholera on board may anchor off Takaing Pagoda on the west bank of the river about 2 miles below Bassein. Vessels with other diseases on board may anchor anywhere below the wharves.

FACILITIES

6A-24 BASSEIN, Burmas's second largest seaport, is situated on the east bank of the Bassein River. The town is the administrative center for the Bassein District of the Irrawaddy Division. The port is under the administration of the Port Officer. Bassein is primarily a rice-shipping port; rice and rice products represent the bulk of the port's commerce. In 1963 Bassein had an estimated population of 100,000.

BERTHS.—Wharfage consists of numerous small, flimsy, timber-finger piers and several small pontoon piers with depths alongside of from 10 to 15 feet. They provide about 2,400 feet of berthing space suitable only for lighters and native craft.

Three fixed moorings capable of accommodating vessels up to 350 feet in length lie close off the finger piers in depths of 18 to 22 feet. Larger vessels sometimes anchor or moor off the piers.

Three alongside berths for vessels of 475 feet in length and two mooring buoys for vessels up to 400 feet in length are available in depths of from 30 to 75 feet.

TUGS.—Harbor craft includes 3 tugs and 4 towing launches.

CARGO INFORMATION.—Panmawaddy Flat limits the amount of cargo that can be loaded at Bassein so that some vessels must top-off at Rangoon.

The port is not equipped with cranes or other mechanical means for handling cargo. A fleet of over 100 lighters are loaded and discharged manually at the finger piers. Vessels use their own gear for handling cargo to and from the lighters.

Covered storage includes a number of sheds, warehouses, and buildings used for the storage of paddy and rice, packaged petroleum products, and general cargo. The capacity of the rice storage sheds is approximately 250,000 tons.

PROVISIONS.—Fresh provisions are obtainable in small quantities, but may be inferior in quality. Rice may be obtained in quantity.

DECK AND ENGINE SUPPLIES.—All supplies must be brought in from Rangoon.

FUEL.—Bassein is not a bunkering port. Small quantities of coal and packaged petroleum products, including diesel oil and gasoline, may be obtained in an emergency.

WATER.—The supply of water is limited and the delivery rate is slow. Water is piped from wells to three of the landing facilities and may also be obtained by barge at the rate of 50 tons daily. Drinking water should be boiled or chlorinated.

REPAIRS.—Minor repairs are undertaken. Shipyard facilities are adequate only for river craft. There is a marine railway with a hauling capacity of 85 tons.

COMMUNICATIONS.—Daily communication by steamer via the inland waterway is maintained with Rangoon. Bassein is connected by railroad and telegraph with the general systems. There is an airfield.

MEDICAL.—There is a general hospital and a contagious disease hospital. Cholera prevails mostly from February to May.

IRRAWADDY DELTA COAST (CONTINUED)

6A-25 FROM PURIAN POINT TO BARAGUA POINT (15°43'N., 95°20'E.), located about 55 miles eastward of Purian Point, most of the mouths of the large outlets of the Irrawaddy River indent the delta coast. The land between the outlets is low and swampy and without landmarks conspicuous from positions southward of the shallow bank which fronts this section of the coast. The above-mentioned bank, with depths of 3 fathoms and less, fronts the coast between Purian Point and Baragua Point and extends southward up to about 17 miles offshore from a position about 10 miles west-northwestward of Baragua Point. BARAGUA FLATS, about 8 miles southwestward of Baragua Point, and numerous drying patches lie on the east part of the bank. The coast is not visible from the seaward extremity of this bank.

THURIYA (BARAGUA) LIGHT VESSEL, equipped with a radar reflector and a bell, is moored about 25 1/2 miles southwestward of U Pe Beacon (15°44'N., 95°24'E.), which stands about 4 1/2 miles eastward of Baragua Point.

IRRAWADDY DELTA COAST—GULF OF MARTABAN

6A-26 The coast northeastward of Baragua Point to the entrance of the Sittang River borders the Gulf of Martaban. The remaining channels through the Irrawaddy Delta, including the Rangoon River, empty into the gulf.

ANCHORAGE.—Anchorage is afforded anywhere in the Gulf of Martaban where depths will permit. When anchoring, the direction and velocity of the current should be ascertained before paying out a full scope of chain.

The Gulf of Martaban is discussed further in section 6A-54.

THE COAST FROM BARAGUA POINT TO THE CHINA BAKIR RIVER ENTRANCE, about 60 miles northeastward of Baragua Point, is low and swampy. A flat with depths of 3 fathoms and less fringes this section of the coast and is charted at distances up to about 6 miles offshore.

PYMBONG BEACON stands along the coast about 7 miles east-northeastward of U Pe Beacon.

KRISHNA SHOAL, a narrow ridge of hard sand with depths of 1 1/4 to 3 fathoms, lies with its southwest edge about 11 miles southeastward of U Pe Beacon. From its southwest edge the shoal lies northeastward for about 13 miles. Depths between Krishna Shoal and the flat which fringes the shore are 3 1/4 to 4 fathoms.

SANDA (KRISHNA) LIGHT VESSEL, equipped with a radar reflector, is moored about 16 1/2 miles southeastward of U Pe Beacon. A FOG SIGNAL is sounded from the light vessel.

A mud volcano was observed in 1922 in the Gulf of Martaban in approximate position 15° 51'N., 96°01'E., about 40 miles east-northeastward of Baragua Point. A mud volcano 2 feet above the water was sighted in 1932 near the same position.

PYAPON RIVER, the westernmost outlet of the China Bakir River, flows into the gulf about 36 miles northeastward of Baragua Point. The main outlet of the CHINA BAKIR RIVER empties into the gulf between extensive mudflats about 24 miles northeastward of the mouth of the Pyapon. The coast near the main outlet is well-wooded. Man-

groves line both banks of the river. A clump of coconut palms stand on the west side of the entrance of the river. A pagoda stands at the village of Kanyingon, situated about 1 1/2 miles northeastward of the east entrance point of the river. Bassein Creek, navigable by small craft at high water, branches off from the main outlet of the China Bakir about 2 1/2 miles within its entrance and connects with the Rangoon River about 10 miles below the city of Rangoon.

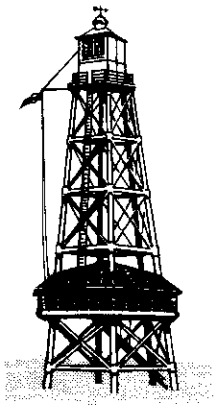
DAGON (CHINA BAKIR) LIGHT FLOAT (16°00'N., 96°14'E.), equipped with a bell, is moored about 20 miles south-southeastward of the entrance of the China Bakir River and about 30 miles south-southwestward of the entrance of the Rangoon River.

APPROACHES TO THE RANGOON RIVER

6A-27 ELEPHANT POINT (16°28'N., 96° 20'E.), about 16 miles northeastward of the entrance of the China Bakir River, marks the west side of the entrance of the Rangoon River.

GROVE POINT, located on the east side of the entrance of the Rangoon River, is low and lies about 3 1/2 miles east-northeastward of Elephant Point.

The land on both sides of the entrance of the Rangoon River, very low and mostly covered with tidal forests and mangrove swamps, is not visible from seaward until about 7 miles from the coast.



EASTERN GROVE LIGHTHOUSE

TAZAUNG TOWER stands on the coast about 3 1/2 miles east-northeastward of the east entrance point of the China Bakir River. Two Survey Beacons stand on Spit Sand (sec. 6A-31) about 2 1/2 miles southward and 5 miles south-southwestward, respectively, of Elephant Point and are reported to be conspicuous. These white, conical, framework beacons with black topmarks stand on black bases. Another survey beacon stands close offshore about midway between the entrances of the China Bakir and Rangoon Rivers.

Three disused tide gauges stand on the bank (sec. 6A-31) fronting the shore between the afore-mentioned river entrances. These are located about 3 3/4 miles southward of Tazaung Tower and about 5 3/4 miles south-southwestward and 2 1/2 miles southward, respectively, of Elephant Point. The remains of the old China Bakir Lighthouse, which was destroyed, are charted about 4 miles south-southeastward of Tazaung Tower.

NAVIGATION

6A-28 Soundings are not an accurate guide in approaching the entrance of the Rangoon River. It is well to remember that the shore of the Irrawaddy Delta is so low as to be invisible until within a few miles of it and that shallow banks extend in places to considerable distances offshore. The entrance of the river should not be attempted without first sighting Dagon (China Bakir) Light Float. During February and March when thick fogs are frequent, great caution is necessary when approaching the entrance.

The pilot vessel will transmit for radio direction-finder bearings during watch hours, upon prior request by a vessel for this service. See section 6A-35.

WINDS—WEATHER

6A-29 The winds at the entrance of the Rangoon River are northeasterly in December and veer eastward, blowing fresh during the day. The weather is generally fine. In January the wind is more northerly, but sometimes a strong easterly wind prevails for several days. Towards the end of the month, light land and sea breezes are observed in conjunction with thick and hazy weather.

In February and March the land and sea breezes are regular. Near the shore the sea breezes are fresh and generally the strongest at the time of spring tides. Thick fogs prevail.

The Southwest Monsoon commences about the middle of April. After a few stormy days the weather is clear until the beginning of May when the monsoon develops fully and continues with few breaks until the end of October. In May and October there is heavy but not continuous rainfall; in July and August continuous rainfall is often experienced.

TIDES—TIDAL CURRENTS

6A-30 Tides in the approaches to and in the Rangoon River are semidiurnal.

TIDAL HEIGHTS ABOVE *CHART DATUM.—China Bakir (old lighthouse): MHWS 15.7 feet, MLWS 1.5 feet; MHWN 11.3 feet, MLWN 5.9 feet.

Elephant Point: MHWS 21.7 feet, MLWS 2.4 feet; MHWN 16.2 feet, MLWN 7.8 feet.
*B.A. Chart 833.

A TIDE GAUGE and tide gauge tower (beacon, sec. 6A-33) stand on Elephant Point; the remains of another tide gauge lie about 5 3/4 miles south-southeastward of the point.

TIDAL CURRENTS.—Between a position about 22 miles south-southwestward of Baragua Point and the entrance of the Rangoon River the tidal currents set northeastward and southwestward, flood and ebb, respectively. During the Northeast Monsoon the velocity at springs is 2 to 4 knots; near the entrance of the Rangoon River the velocity is greater. The ebb current is the stronger. Occasionally in October and November, a westerly set is observed sufficiently steady and strong enough to overcome the flood which sets to the northeastward.

There are rotary tidal currents, which shift clockwise, off the mouths of the Irrawaddy River and off Baragua Flats. During the Northeast Monsoon these currents attain velocities of 1 1/2 to 2 knots at springs and about 3/4 knot at neaps. Close to the mouths the tidal currents set in and out of the channels, attaining their greatest velocities at high and low water.

In the vicinity of the pilot vessel station, about 20 miles southward of Elephant Point, the flood current sets about 034° and the ebb about 214°. Time of high water in this vicinity occurs about 1 1/2 hours earlier than at Elephant Point.

In Western Channel the flood current begins setting northeastward toward the entrance of the river, but after the flats nearby are covered, about 2 1/2 hours after low water, the flood current changes direction and sets strongly onto Spit Sand over which it runs directly for Elephant Point. The velocity at springs is 5 to 6 knots. Considerable eddies may be experienced off Elephant Point, especially on the first of the flood. The great body of the flood passes eastward into Sittang River. In Eastern Channel the flood current is comparatively weak and sets in 20 to 30 minutes later than the flood current in Western Channel.

The ebb current sets southwestward in Western Channel outside Elephant Point. In Eastern Channel the ebb sets southeastward at first and then rounds the southeast edge of Eastern Sands and sets southwestward. The velocity of the ebb is 6 knots at springs. Southeastward of Elephant Point the ebb currents set across the channel onto a part of Eastern Sands.

DEPTHS—DANGERS

6A-31 Changes in the depths and in the positions of the flats and shoals in the Rangoon River and its entrance are so constant that the chart must be used with caution. A shifting bar with fluctuating depths obstructs the approaches to the entrance of the river. The bar has a soft-silt bottom.

The 6-fathom curve is charted about 25, 30, and 35 miles, south-southeastward, southward, and south-southwestward, respectively, of Elephant Point. The 3-fathom curve is defined in an irregular line about 7 to 13 miles southeastward to southward of the point. Regular depths decrease gradually over a wide area between the curves.

An extensive drying mudbank fronts the coast between the mouth of the China Bakir and Elephant Point and extends from 2 to 4 1/2 miles offshore. CHINA BAKIR FLATS comprise the southwest part of the bank; SPIT SAND forms the northeast part of this bank which borders the northwest side of Western Channel. Depths of 3 fathoms and less lie off the edge of this bank.

EASTERN GROVE FLATS, an extensive

bank of mud and sand which dries, extend nearly 7 miles southeastward from Grove Point. These flats form the east side of a channel which lies between the flats and Eastern Sands. A shoal area with depths of less than 3 fathoms lies up to about 8 miles farther southeastward from the south edge of Eastern Grove Flats. This shoal area lies in an east-northeastward direction towards the mouth of the Sittang River. Several drying sandbanks lie off the flats and as the south or seaward edge of this extensive bank has not been thoroughly examined, the area should be given a wide berth.

A 2 1/2-fathom depth is charted about 20 miles southeastward of Grove Point. The area in this vicinity is reported to have shoaled considerably.

EASTERN SANDS, a shoal with depths of less than 6 feet and which in places dries to 8 feet, lies on the east side of Eastern Channel and between 2 and 7 miles southward of Grove Point.

A depth of 5 feet lies in the entrance about 5 1/2 miles 197° from Thante (Eastern Grove) Light Structure.

An OBSTRUCTION, position approximate, was reported in 1945 to lie about 26 1/2 miles 188° from Elephant Point.

A dangerous sunken WRECK lies a little more than 3 miles 147° from Elephant Point. Another WRECK, with masts showing, lies about 5 1/4 miles 145° from the point; a lighted green can buoy is moored close northward of the wreck.

A dangerous sunken WRECK lies about 5 3/4 miles 193° from Elephant Point; a lighted green can buoy is moored about 1/4 mile eastward of the wreck.

ENTRANCE CHANNELS

6A-32 Entrance channels of the Rangoon River shift frequently as the result of excessive silting. In 1965 EASTERN CHANNEL, the navigable entrance channel with a depth of 11 feet, passed westward of the west side of Eastern Sands and eastward of Spit Channel. Spit Channel had to be closed and is no longer identified on the chart.

EASTERN CHANNEL, marked by floating aids, leads northward to the entrance from a position about 14 miles southward of Thante Light Structure.

WESTERN CHANNEL, unmarked, lies just eastward of and parallel to the drying mudflat which extends from the shore between the mouth of the China Bakir River and Elephant Point. In 1964 Western Channel was not used by ocean vessels.

An unmarked channel with a least depth of 8 feet lies between Eastern Grove Flats and the east side of Eastern Sands.

NAVIGATIONAL AIDS

6A-33 THANTE (EASTERN GROVE) LIGHT is shown from a position on the east side of the entrance a little over 1/2 mile east-southeastward of Grove Point.

A TOWER and tide gauge, which is an unlighted iron framework BEACON, 51 feet high, stands close southwestward of the extremity of Elephant Point. The structure is mounted on rails and is moved farther inshore from time to time because of erosion of the coast.

The navigational aids in the entrance channel and in the river to the port of Rangoon are moved as necessary to mark the channels.

LANTHAYA (FAIRWAY) LIGHT FLOAT is moored about 19 miles south-southwestward of Thante Light Structure.

LOWER (AUKMEPYAYIN) (EASTERN CHANNEL) LIGHT FLOAT is moored about 13 3/4 miles southward of Thante Light Structure.

UPPER (AHTETMEPYAYIN) (CENTER EASTERN) LIGHT FLOAT, equipped with a radar reflector, is moored about 9 3/4 miles southward of the light structure.

UPPER EASTERN LIGHT BUOY, a black conical buoy, is moored about 6 3/4 miles southward of the light structure.

MYE SAON (SPIT) LIGHT VESSEL, equipped with a bell, is moored about 5 1/4 miles southward of the light structure.

CENTER SPIT LIGHT BUOY, a black can buoy, is moored about 4 3/3 miles south-southwestward of the light structure.

UPPER SPIT LIGHT BUOY, a black can buoy, is moored about 3 1/4 miles southwestward of the light structure.

The uniform system of buoyage is not used in the Rangoon River and its approaches.

ANCHORAGES

6A-34 Deep-draft vessels, awaiting a pilot or anchoring for other reasons, should anchor eastward of Dagon (China Bakir) Light Float. In good weather, sea and swell permitting,

medium-draft vessels may anchor about 2 miles eastward of Lanthaya (Fairway) Light Float.

Deep-draft vessels drawing over 24 feet may not anchor at the pilot station. A message from the pilot vessel will advise of a safe anchorage and also when to return to embark the pilot.

PILOTAGE—PILOTS—EXPECTED TIME OF ARRIVAL

6A-35 Pilotage to the port of Rangoon is compulsory for all vessels over 100 net tons. Vessels will be piloted at night as far as the anchorage about 17 miles above Elephant Point.

The PILOT VESSEL is usually at anchor about 20 miles southward of Elephant Point. The pilot vessel is a small, white passenger vessel with raised forecastle and unraked masts. The word PILOT is painted amidships, forward of the funnel. A steam tender assumes the pilot vessel's station when the pilot vessel is temporarily withdrawn for any reason. In February of 1966, the name of the white pilot vessel on station was THAMADA.

During the Northeast Monsoon, the pilot vessel's normal station is about 1 1/2 miles eastward of Lanthaya Light Float.

To avoid delay, vessels bound for Rangoon must radio the pilot vessel (call sign XYC Z, 500 kcs.) 48 hours in advance, giving their expected time of arrival at the pilot station and their deepest fresh-water draft. In case pilot vessel cannot be contacted, message may be sent via Rangoon Radio to the harbor master and vessel's agents.

During fog or thick weather, the pilot vessel, whether at anchor or underway, sounds the letter Z of the International Morse Code on her whistle or siren when the whistle or siren of an approaching vessel is heard. This signal is repeated by the pilot vessel for so long a period as may be necessary to enable the approaching vessel to locate the pilot vessel. The signal to be made by the approaching vessel is in accordance with Article 15 of the International Rules of the Road (Regulations for Preventing Collisions at Sea). The approaching vessel must always consider the pilot vessel as having the right of way. In addition to the above sound signals the pilot vessel exhibits the following signals:

By day.—The regulation pilot boat flag (white and red horizontal stripes).

When riding at anchor, a black ball or shape not less than 2 feet in diameter, in the forward part of the vessel at such a height as to be clear of all superstructures other than the funnel and not less than 20 feet above the hull.

By night.—Lights as prescribed in Article 8 of the International Rules of the Road, and in addition, when at anchor the lights prescribed in Article 11.

A vessel approaching the pilot vessel to obtain a pilot should pass astern and never ahead of her. When the vessel embarking a pilot is in position astern of the pilot vessel she should make a lee for the boarding boat. Because of eddies, especially during the ebb tidal current vessels approaching the pilot vessel at reduced speed often fail to respond the the helm.

A light-draft vessel embarks the pilot 1 hour before time of low water at Elephant Point. A loaded vessel (up to 24-foot draft) embarks the pilot at time of low water at Elephant Point. A deeply loaded vessel (over 24-foot draft) embarks the pilot at time of low water at Rangoon.

Reports indicate, depending on the amount of trafffic, that arriving and departing vessels may experience delays due to a shortage of deep-water pilots.

Immediately after boarding, the pilot turns over to the master of each incoming vessel a copy of Rangoon Port Rules. This must be returned to the pilot on the outbound passage after departing Rangoon.

DIRECTIONS

6A-36 Vessels approaching the entrance of the Rangoon River from the westward should pass about 5 miles southward of Pathein (Alguada) Reefs Lighthouse and thence steer to pass about 3 1/2 miles southward of Thuriya (Baragua) Light Vessel (15°20'N., 95°01'E.). Thence course should be shaped to make good 090° for 17 miles, whence course should be altered to the northeastward to pass southward of Sanda (Krishna) Light Vessel (15°33'N., 95°36'E.), keeping in depths of not less than 10 fathoms so as to clear the shoal area which lies up to about 17 miles southward of the mouth of the Ir-

rawaddy River. After passing Sanda Light Vessel steer for Dagon (China Bakir) Light Float (16°00'N., 96°14'E.) giving a good berth to the mud volcano charted in approximate position 15°51'N., 96°01'E. From Dagon Light Float steer northward for the Pilot Vessel Station and Lanthaya Light Float.

Vessels approaching the entrance of the Rangoon River from the eastward should steer for Dagon Light Float and keep in depths of not less than 5 1/2 or 6 fathoms. Consideration must be given the tidal current, remembering that the flood or northeastgoing current sets very strongly toward and over the shallows off the entrance of the Sittang River.

RANGOON RIVER TO RANGOON (16°46'N., 96°10'E.)

6A-37 THE RANGOON RIVER, the easternmost channel through the Irrawaddy Delta, flows into the Gulf of Martaban between Elephant Point and Grove Point. The river channel leads in a general north-northwestward direction from Elephant Point to the port of Rangoon, located about 21 miles above the entrance of the river. Most of the low, flat, and sparsely-wooded land bordering the river consists of rice paddies. Compact clumps of trees stand in the vicinity of the villages.

NAVIGATION

6A-38 The port of Rangoon is accessible to ocean vessels drawing 30 feet. In 1964 the maximum safe draft of 30 feet was dependent on spring tides to cross the bar at Monkey Point. The bend in the channel at Monkey Point imposes a maximum length limitation of 600 feet to vessels which can be safely taken through the channel in this vicinity. There is no beam restriction. Vessels over 600 feet in length are usually anchored below Hastings Sand.

Night navigation on the river is practicable up to within the harbor limit, southward of Hastings Sand.

CLIMATE—WEATHER

6A-39 The climate in Rangoon is tropical throughout the year with three distinct seasons which are the monsoon, the cool, and the hot periods. During the monsoon season (Southwest Monsoon), from about mid-May through September, Rangoon receives most of its average 100-inch rainfall for the year. Temperatures are moderately warm, 75 to 90 degrees, but the humidity is very high. After a brief period of warm, humid weather following the monsoon, the cool season begins about mid-November. From this time until March the weather is pleasantly cool, 65 to 85 degrees, and dry with low humidity. Days are sunny with the nights being cool and the weather is clear. Beginning in March the temperature and humidity commence to rise uncomfortably and the dry land bakes in the hot season until the first of the monsoon rains bring relief. During this season the temperature may rise to 106 degrees although the average would be about 95 degrees.

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

TIDES—TIDAL CURRENTS

6A-40 Tides at Rangoon are semidiurnal. The Rangoon River tides are subject to a large diurnal inequality; the times of high and low water may occur as much as an hour before or after the computed times. The rise and fall of the tide at the port as well as near the entrance of the river is considerable.

Several TIDE GAUGES stand on the banks of the river between its entrance and the anchorage southward of Hastings Sand.

A TIDE GAUGE and a TIDAL SEMAPHORE stand in the harbor about 1/4 mile westward of Monkey Point.

The position of the three arms of the tidal semaphore as observed from southward indicate the height of the tide above low water springs tide level as follows:

UPPER ARM

Inclined to the right at 45° angle—1 fathom.

Placed horizontally to right—2 fathoms.

Inclined to right at 45° angle below horizontal—3 fathoms.

Inclined to left at 45° angle—4 fathoms.

CENTER ARM

Inclined to right at 45° angle—1 foot.

Placed horizontally to right—2 feet.

Inclined to right at 45° angle below horizontal—3 feet.

Inclined to left at 45° angle—4 feet.

Placed horizontally to left—5 feet.

LOWER ARM

Inclined to right at 45° angle—3 inches.

Placed horizontally to right—6 inches.

Inclined to right at 45° angle below horizontal—9 inches.

TIDAL HEIGHTS ABOVE *CHART DATUM.—Rangoon: MHWS 19.2 feet, MLWS 2.2 feet; MHWN 14.5 feet, MLWN 5.2 feet. *B.A. Chart 833.

TIDAL CURRENTS.—In the river the current follows the course of the channel. Along this course during spring tides there are strong eddies off the points of land; the tidal currents attain excessive velocities.

Close within the entrance of the river above Elephant Point the channel is confined between Middle Bank and the west bank of the river; here the flood current attains velocities of 5 to 6 knots at springs. Above Middle Bank the velocity decreases.

The tidal current attains its maximum velocity of 5 to 6 knots in the channels on the night of the second day after full or new moon. The interval of slack water is only a few minutes. After neap tides the tidal current gradually increases in velocity and is rapid until the moon quarters when the velocity suddenly decreases. On the second and third day after the moon quarters there is slack water on the flood current for 1 1/2 hours and for 1 hour on the ebb.

At springs the flood current sets in abruptly and the tide rises 6 feet in the first hour. During this period the ebb current continues running in midchannel; slack water occurs at the end of this hour. The flood current turns earlier inshore than in midchannel.

The effect of the rains which augment the river during the rainy season, June to September inclusive, is to weaken the flood current and strengthen the ebb. At times the flood current is weakened to the extent that vessels moored in Rangoon Harbor do not swing to it.

During spring tides, at times other than the rainy season, tidal currents in the harbor may attain velocities of 5 to 6 knots. The flood current commences about 1/2 hour after time of low water and the ebb about 1 1/4 hours after time of high water.

TIDAL BORE.—Tidal bores, about 3 feet in height, sweep up the Pegu River in the sudden rising of the early flood, especially in February, March, and April.

DEPTHS—DANGERS—DRAFTS—NAVIGATIONAL AIDS

6A-41 Bars in the river cause fluctuation in depths. Large quantities of silt are brought downstream. In suspension, the silt gives the water a deep yellow color; when deposited, it forms many banks. Usually the controlling river depths over the bars range between 24 and 31 feet at high water, but vary depending on tides which have considerable variance throughout the year. The maximum depths occur toward the end of the monsoon season, August to November. The minimum depths occur prior to the monsoon season, February to May.

The positions of the bars and banks, as well as the depths over them, are constantly changing; the chart should not be accepted as completely accurate and up-to-date.

Draft limitations are calculated according to the prevailing depths over the bar at the entrance of the river. Provisional drafts, subject to change without notice, are forecast for each month. In February of 1966 the following inbound drafts were forecast: 24 3/4 to 30 feet for March, 21 to 28 1/2 feet for April, and 22 1/3 to 28 1/2 feet for May. Maximum drafts coincide with periods of spring tides and minimum drafts are forecast for neap tides.

The description of the Rangoon River between its entrance and the port of Rangoon is confined to the shoals and banks in midriver and to the navigational aids which indicate most conspicuously the navigable channel past them. Other beacons, buoys, and landmarks appear on the chart and on the banks of the river. Many of these are used for survey purposes only and are not described herein.

A white BEACON, 70 feet high with a black topmark of a disc above a triangle, stands on the east bank of the Rangoon River, about 2 3/4 miles northwestward of Eastern Grove Light Structure.

MIDDLE BANK, a continuation northwestward of Eastern Sands, lies in midstream with its northwest extremity located about 3 miles northward of Deserters Creek Range Lights. Middle Bank dries from 1 foot to 12 feet. Lower Middle Bank Light Buoy, a black can, is moored about 700 yards northeastward of Elephant Point. Central Middle Bank Light Buoy, a black can, is moored about 1 mile northwestward and Upper Middle Bank Light Buoy, a black can, is moored about 2 1/4 miles northwestward, respectively, of Elephant Point.

Dangerous sunken WRECKS, with depths of 19 and 13 feet over them, are charted about 1 1/2 and 2 1/4 miles northwestward, respectively, of Elephant Point. Another WRECK, about 1 3/4 miles north-northwestward of Elephant Point, lies stranded on Middle Bank.

The entrance of DESERTERS CREEK cuts the west bank of the river about 2 miles west-northwestward of Elephant Point.

6A-42 THINKONE (THINGONLAN) (DESERTERS CREEK) RANGE LIGHTS, three lights giving two lines of transit, stand on the west bank of the river about 1/2 mile northwestward of the entrance of Deserters Creek. The center range light forms a common front light for both lines of transit; all three lights are shown from white iron framework towers with square daymarks. The lights for the lower reach in range 296 1/2° lead from the entrance of the Rangoon River between its west bank and the southwest edge of Middle Bank. In 1961 there was less water than charted on the 296 1/2° range. The lights for the upper reach in range 154 1/2° lead between the west bank of the river in the southwest and Middle Bank, a shoal joining Middle Bank and Hmawun Lumps, and Hmawun Lumps on the northeast.

HMAWUN LUMPS, which dries from 1 foot to 4 feet, consists of several shoals which lie on the east side of the channel, about 5 miles north-northwestward of the entrance of Deserters Creek. Hmawun Lumps Light Buoy, a black can, marks the northwest side of the shoals.

HMAWUN BEACON, a mast with a black ball topmark, stands on the west bank of the river about 6 miles north-northwestward of the entrance of Deserters Creek.

A stranded WRECK lies on the shoal on the east side of the channel in a position about 2 3/4 miles southeastward of Hmawun Beacon. A depth of 17 feet is charted in the channel about 1/2 mile east-northeastward of Hmawun Beacon. An OBSTRUCTION, with a depth of 12 feet, lies about 1 mile 057° from the beacon. A dangerous sunken WRECK, with a depth of 9 feet over it, lies in the channel 1 3/4 miles 030° from the beacon; a green can LIGHT BUOY is moored close southward of the wreck.

DANOT BEACON stands on the west bank of the river in a position about 2 1/4 miles northward of Hmawun Beacon. Danot Beacon marks the north entrance point of Bassein Creek which connects the Rangoon River with the China Bakir River. Kyauktan Creek enters the east side of the Rangoon River about 3 miles southeastward of Danot Beacon.

SOUTH BEACON, white with a basket topmark, stands on Dry Tree Point which is located on the east bank of the river about 1 1/2 miles eastward of Danot Beacon.

A sunken WRECK, with a depth of 5 feet over it, lies close to the east bank at Dry Tree Point. Another sunken WRECK, with a depth of 8 feet over it lies near the west bank a little more than 1/2 mile south-southeastward of Danot Beacon.

D'SILVA SHOAL, which has a least depth of 2 feet, extends about 1 3/4 miles southeastward from North D'Silva Point, located on the west bank of the river about 3 miles northward of Danot Beacon. D'Silva Shoal Light Buoy, a black can, is moored about 200 yards eastward of the east side of the shoal, about 1 1/2 miles northward of Dry Tree Point.

FALAN (THILAWA) (CHOKEY) TRACK RANGE LIGHTS are shown from white framework towers with square daymarks which stand on the east bank of the river about 2 miles northward of Dry Tree Point. These lights in range 136 1/2° lead eastward of Chokey Shoal which will be described subsequently.

Three range lights giving two lines of transit are shown at THILAWA (Devil's Hole) on the east bank of the river about 2 1/2 miles northward of Dry Tree Point. The center light, shown from a white framework tower, forms a common rear light for both lines of transit. The front range lights are shown from white iron columns. The lower reach lights are in range 014° and lead between the east bank of the river and D'Silva Shoal. A least depth of 20 feet is charted on the axis of the 014° range nearly 1 mile north-northeastward of Hmawun Beacon. A shoal with a least depth of 17 feet lies close westward of the axis of the 014° range in a position about 1 1/4 miles north-northeastward of Hmawun Beacon. The upper reach lights, in range 110°, lead southward of Chokey Shoal. A least depth of 21 feet is charted on the axis of the 110° range about 1/2 mile eastward of the front light structure of the Thetkaikwin (D'Silva) Range.

222-679 O - 66 - 18

SINHA'S BEACON, a rail with a basket topmark, stands on the west bank of the river about 2 1/4 miles north-northeastward of Danot Beacon.

RANGOON HARBOR

6A-43 RANGOON HARBOR in the Rangoon River encompasses the river area northward and westward of the harbor limit, a position about 13 miles upstream from the entrance of the river.

HARBOR LIMITS.—A line drawn in a 071° direction from Sinha's Beacon to North Beacon on the opposite bank of the river indicates the south limit of the harbor.

The harbor limit in the Pegu River is indicated by a line between a pillar on each bank which stand about 1 1/4 miles northeastward, respectively, of Syriam Point and Pegu Point.

A line across the Rangoon River between a pillar on either bank about 3 1/2 miles above Mowers Point marks the northwest limit of the harbor.

DEPTHS—DANGERS—NAVIGATIONAL AIDS (CONTINUED)

6A-44 An OBSTRUCTION, with a depth of 23 feet, was reported to lie in the channel in a position nearly 1 mile eastward of Sinha's Beacon. A dangerous sunken WRECK, with a depth of 6 feet, is charted in a position near the east bank a little more than 1 mile eastward of Sinha's Beacon. An OBSTRUCTION, with a depth of 2 feet, lies on the north part of D'Silva Shoal near the west bank, about 1/4 mile southeastward of Sinha's Beacon.

CHOKEY SHOAL, with a least charted depth of 13 feet (1965), lies nearly in the middle of the river with its south end charted about 3/4 mile north-northwestward of North D'Silva Point. Lower Chokey, Middle Chokey, and Upper Chokey black can light buoys are moored about 1/4 mile north-northeastward, nearly 1 mile northwestward, and 1 1/2 miles north-northwestward, respectively, of North D'Silva Point.

Chokey Track, which leads between Chokey Shoal and the east bank of the river, is liable to sudden shoaling and may have depths of less than 12 feet between August and March.

A dangerous sunken WRECK, with a depth of 12 feet, lies in the channel eastward of Chokey Shoal in a position about 1 mile north-northwestward of North D'Silva Point.

THETKAIKWIN (Thetkekwin) (D'SILVA) RANGE LIGHTS, two lights in range 177°, are shown from white iron framework towers, topmarked with white square daymarks, which stand on the west bank of the river about 3/4 mile west-northwestward of North D'Silva Point.

Bailey's Beacon, a survey beacon with a basket topmark, stands on the west bank of the river about 1 3/4 miles west-northwestward of North D'Silva Point.

Several BEACONS stand on the east bank at CHOKEY POINT, which is located about 1 1/2 miles northward of North D'Silva Point.

Liffey Sand was a drying bank formerly charted as lying along the west side of the deepwater channel from a position 3 3/4 miles north-northwestward of North D'Silva Point to a position 1 1/2 miles farther northward. In 1965, Liffey Sand was no longer carried or identified on the chart; shoal depths of less than 6 feet are charted in this area.

A black can LIGHT BUOY is moored in shoal water on the west side of the deepwater channel in a position about 3 1/4 miles northward of the front light structure of the Thetkaikwin Range.

A dangerous sunken WRECK, with a depth of 8 feet, is charted on the west side of the deepwater channel in a position about 2 3/4 miles northward of the front light structure of the Thetkaikwin Range.

EAST HARBOR BEACON stands on the east bank of the river about 3 miles northward of Chokey Point.

MEASURED DISTANCE.—In the reach northward of Chokey Shoal, a measured mile is indicated by two pairs of beacons standing on the east bank of the river; the south pair is located a little over 3/4 mile north-northwestward of Chokey Point.

6A-45 HASTINGS SAND, which dries to 4 feet, lies with its southeast edge about 1 1/4 miles east-southeastward of the light structure on the southeast extremity of Kings Bank Training Wall. Its northwest edge is charted about 1/2 mile east-northeastward of the

light structure. A black can LIGHT BUOY is moored close eastward of the southeast edge of Hastings Sand; a stranded WRECK with a BEACON on it lies close east-northeastward of its northwest edge.

Cross Sands Channel was formerly charted between Hasting Sand and Liffey Sand. In 1965 the channel was no longer carried or identified on the chart.

KINGS BANK SAND, which dries about 1 foot, lies parallel to and about 1/2 mile westward of Hastings Sand, but is much smaller in extent than the latter. The southeast edge of Kings Bank Sand is charted about 3/4 mile southeastward of the light structure on the southeast extremity of Kings Bank Training Wall.

An unnamed SAND, which dries 3 feet, lies with its south edge about 1 1/4 miles southeastward of the light structure. A stranded WRECK is charted on its south edge.

WEST HARBOR BEACON and KINGS BEACON stand on the west bank of the river about 5 and 5 1/2 miles north-northwestward, respectively, of North D'Silva Point.

KINGS BANK TRAINING WALL extends east-southeastward from a position on the west bank of the river about 1 mile northwestward of Kings Beacon. A LIGHT is shown from the southeast extremity of the training wall.

A dangerous sunken WRECK, with a depth of 40 feet, is charted in the deepwater channel eastward of Hastings Sand and lies about 1 1/4 miles eastward of the light structure on the southeast extremity of Kings Bank Training Wall.

PEGU RIVER flows into the Rangoon River between Syriam Point and Pegu Point. Syriam Point, on the east bank of the Rangoon, is located nearly 2 miles north-northwestward of East Harbor Beacon. Pegu Point lies a little more than 1 mile west-northwestward of Syriam Point. The Pegu River is navigable by light-draft vessels only.

MONKEY POINT, about 1/2 mile southwestward of Pegu Point, is on the north bank of the Rangoon River at the east end of the city of Rangoon. Monkey Point is also the southwest entrance point of Pazundaung Creek.

MONKEY POINT TRACK RANGE BEACONS and HASTINGS TRACK RANGE BEACONS stand on the east bank about 200 yards and 1/4 mile south-southwestward, respectively, of Syriam Point. These two pairs of range beacons give two separate tracks which lead into the port of Rangoon. In 1965, Monkey Point Track and Channel had least charted depths of 10 to 12 feet; Hastings Track had a least charted depth of 7 feet.

Lower Monkey Point Light Buoy, a black can, is moored on the west side of Monkey Point Channel, about 1/2 mile southeastward of Monkey Point. Upper Monkey Point Light Buoy, a black can, is moored on the south side of the channel, about 1/4 mile southeastward of the point.

A green can light buoy marks a sunken WRECK and OBSTRUCTIONS off the entrance of Pazundaung Creek and is moored a little less than 1/2 mile eastward of Monkey Point.

Southeastward of Monkey Point abreast the entrances of Pegu River and Pazundaung Creek the channel of the Rangoon turns abruptly to the westward.

6A-46 THE PORT OF RANGOON is principally a 3 1/2-mile section of the Rangoon River westward of Monkey Point.

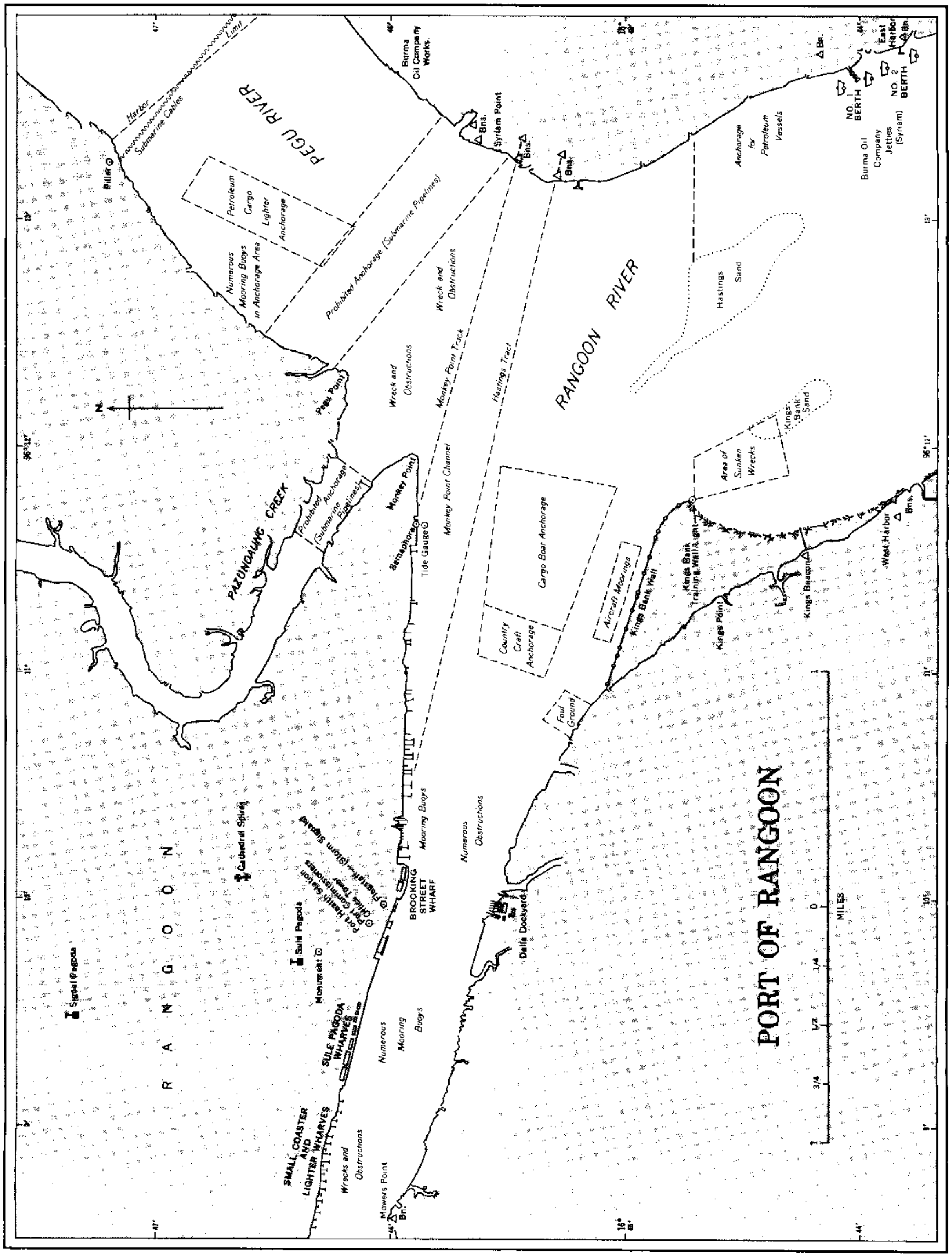
WRECKS and OBSTRUCTIONS still exist in Rangoon Harbor, especially between positions 1 1/4 and 3 1/4 miles westward of Monkey Point. Local knowledge concerning the current status of these dangers is an essential requirement.

Between about 1 mile and 1 3/4 miles westward of Monkey Point, depths in the river range from 21 to 36 feet. These depths are charted abreast of the small wharves nearest to Monkey Point. Farther westward abreast Brooking Steet and Sule Pagoda Wharves the depths range from 25 to 42 feet. Abreast MOWERS BEACON which stands on Mowers Point about 3 1/4 miles westward of Monkey Point, the depths range from 31 to 62 feet.

During the freshet season, July to September, water hyacinths (beda weed) float down the river in what is sometimes an almost solid mass; these may encumber the jetties and moorings and may also foul the propellers of small craft.

ANCHORAGES

6A-47 Anchorages for cargo vessels, vessels carrying explosives, vessels carrying dangerous petroleum products, and quaran-


PORT OF RANGOON
MILES
0
1/4
1/2
3/4
1
RANGOON
RANGOON RIVER
PEGU RIVER
PAZUNDAUNG CREEK
Burma Oil Company Works
Syriam Point
Pegu Point
Monkey Point
Semaphore
Tide Gauge
Petroleum Cargo Lighter Anchorage
Numerous Mooring Buoys in Anchorage Area
Prohibited Anchorage (Submarine Pipelines)
Wreck and Obstructions
Monkey Point Track
Hastings Tract
Monkey Point Channel
Hastings Sand
Kings Bank Sand
Area of Sunken Wrecks
Anchorage for Petroleum Vessels
Burma Oil Company Jetties (Syriam)
NO. 1 BERTH
NO. 2 BERTH
East Harbor
West Harbor
Cargo Boat Anchorage
Country Craft Anchorage
Aircraft Moorings
Kings Bank Wall
Kings Bank Training Wall Light
Kings Point
Kings Beacon
Foul Ground
Mooring Buoys
Numerous Obstructions
BROOKING STREET WHARF
Dala Dockyard
Cathedral Spires
Sule Pagoda
Monument
Signal Pagoda
SULE PAGODA WHARVES
Numerous Mooring Buoys
SMALL COASTER AND LIGHTER WHARVES
Wrecks and Obstructions
Mowers Point
Harbor Limit
Submarine Cables
Bns.
Bn.

tine anchorages are described in the port rules book.

The anchorage for vessels carrying explosives lies in the east side of the river northwestward of Chokey Point.

The lower quarantine anchorage, the same as that for vessels carrying dangerous petroleum products, lies in the east side of the river north-northwestward of Chokey Point and northward to Hastings Sand. This anchorage is used by vessels awaiting favorable tide conditions to cross the bar at Monkey Point; vessels also use the anchorage for topping-off purposes.

The upper quarantine anchorage lies in the harbor westward of Monkey Point.

PROHIBITED ANCHORAGES.—Submarine pipelines are laid across the mouth of the Pegu River and close within the mouth of Pazundaung Creek; anchorage is prohibited in these areas.

Two submarine cables border the limit of the harbor in Pegu River.

MOORINGS

6A-48 Numerous mooring buoys in the harbor westward of Monkey Point provide fixed and free-swinging berths.

The maximum-length vessel that can be accommodated is 550 to 575 feet because of the spacing of the mooring buoys. Vessels with slightly longer lengths can be accommodated by removing a buoy.

Vessels secure to the pendants with their own cables; all mooring shackles must be in good working order.

PILOTAGE—BERTHING

6A-49 Near the bend of the river abreast of Monkey Point, a harbor master and his mooring crew takes over direction of the incoming vessel from the pilot. The vessel is berthed alongside a wharf, anchored, or moored to buoys at the discretion of the harbor master. Unmooring is accomplished by a similar mooring crew. Berthing operations within the harbor are limited to daylight hours.

Masters of vessels preparing to depart must apply for a pilot at least 24 hours prior to the time of sailing. Immediately after a vessel has been cleared of her moorings or otherwise cast off, the outbound pilot takes over direction of the vessel.

SIGNALS

6A-50 Vessels intending to transit Monkey Point Channel during daylight should display the International Code Flag Signal BB when passing Dry Tree Point. If the intentions of the vessel are changed the signal should be lowered for the information of outward-bound vessels.

STORM SIGNALS.—Storm and weather signals in accordance with the Indian Extended System are displayed from a flagstaff near the port commissioners offices. See section 1-34.

REGULATIONS

6A-51 Port officials board vessels off Monkey Point.

Port rules and regulations, given in the book handed the master of an inbound vessel by the boarding pilot, cover in detail the majority of the vessel's activities in the port of Rangoon. The book also contains items of general information. Fines are imposed for violation of many of the rules; a close study of them is obviously important.

FACILITIES

6A-52 RANGOON is the capital, chief city, and principal port of the Union of Burma. The city, with an estimated population of 800,000 (1958), is situated on the north bank of the Rangoon River and westward of the confluence of the Rangoon River, Pegu River, and Pazundaung Creek. Rangoon possesses all the conveniences usually associated with a modern city. The majority of the buildings are of European architecture; systems for transportation, water supply, and sewage disposal have been constructed.

Several suburbs are situated on the opposite south bank; the workshops and shipyards of the large Inland Waterways Transport Board are located in Dalla.

The United States is represented by a consul and a vice consul.

The port is administered and operated by the Commissioners for the Port of Rangoon, a government commission.

Exports consist chiefly of rice and rice bran; other exports are mainly timber and minerals.

BERTHS.—The greater part of the wharves are located along the north bank of the Rangoon River between positions about 1 1/2 and 3 1/2 miles westward, respectively, of Monkey Point.

Approximately 1 mile of wharfage is available. In 1961 there were 11 berths for ocean vessels, 48 pontoon jetties for river and coastal craft, and 36 moorings for accommodating vessels in the stream abreast of the wharves.

Boats can land day or night without difficulty at several pontoon jetties, whatever the stage of the tide.

Sule Pagoda Wharf, with 7 continuous concrete berths numbered 1 to 7, provides a total berthing length of 3,425 feet. Berths 1 to 4 are each about 460 feet in length with a least alongside depth of 19 feet; berths 5 to 7 are each 525 feet in length with a least alongside depth of 24 feet.

Brooking Street Wharf provides 2 berths, each 450 feet in length, with an alongside depth of 24 feet (MLWS).

Public Health Station, located between Sule Pagoda Wharf and Brooking Street Wharf, has a pontoon which is 500 feet in length and is known as Barr Street Wharf. One large vessel or 2 small vessels can be accommodated at the wharf which has a depth alongside of 30 feet. Passengers are handled exclusively at this facility.

Ahlone Wharf, on the north side of the river northwestward of Mowers Point, is 450 feet long with an alongside depth of 27 feet (MLWS).

Hteedan Rice and Coal Wharves, with more than 1,200 feet of berthing space, are located close northward of Ahlone Wharf; Hteedan Coal Wharf has a depth of 23 1/2 feet alongside.

Four petroleum wharves at Syriam accommodate tanker vessels with lengths of 300 to 500 feet. Depths alongside vary from 17 to 25 feet (MLWS).

MOORING BUOY BERTHS.—Single swinging mooring buoy berths and double fixed, bow and stern, mooring buoy berths are established in the harbor westward of Monkey Point.

A fixed mooring facilitates berthing alongside the outer face at each of the two southernmost petroleum wharves at Syriam.

Two single mooring buoy berths are located in the channel between Hastings Sand and the east bank of the river and are used for loading vessels to drafts greater than are permitted to pass through Monkey Point Channel.

TUGS.—Harbor tugs ranging from 220 to 1,600 hp. are operated by the port, but normally they are not required to assist vessels in mooring to the buoys or in going alongside. Two tugs are equipped for fire fighting and 1 fireboat is included in the port harbor craft.

CARGO INFORMATION.—Cargo is generally discharged at the wharves; Sule Pagoda and Brooking Street Wharves handle the bulk of the general cargo. Loading is accomplished at the wharves, moorings, or anchorages. Vessels use their own gear when handling cargo in the stream.

Berth 1 at Sule Pagoda Wharf is equipped with belts and chutes for loading rice.

Cranage at Sule Pagoda Wharf: Berths 2 and 3 are equipped with 5 electric portal-jib cranes, 4 of 1 1/2 -ton capacity and 1 of 3-ton capacity; Berths 5, 6, and 7 have 8 electric portal-jib cranes, 2 of 1 1/2-ton capacity and 6 of 3-ton capacity. There are no shore cranes at Berth No. 4.

Cranage at Brooking Street Wharf consists of 1 1/2-ton capacity electric portal-jib cranes and a 40-ton capacity electric portal-jib crane. Brooking Street Wharf handles all heavy lifts.

Ahlone Wharf has 5 mobile cranes, 3 of 4-ton and 2 of 5-ton capacity.

Rice is loaded by mechanical conveyors at Ahlone and Hteedan Wharves.

Transit sheds and storage yards back all the wharves which have rail clearance.

The number of loaded lighters placed alongside a vessel depends upon the availability of berthing space alongside. Lighters are not placed after 6:00 p.m.

PROVISIONS.—Fresh and staple provisions are obtainable.

DECK AND ENGINE SUPPLIES.—Ships' stores can be obtained.

FUEL OIL.—Fuel and diesel oils are sup-

plied by pipeline to vessels alongside a petroleum wharf at Syriam at rate of 150 tons per hour; vessels in the stream are supplied by oil barges at a delivery rate of about 40 tons per hour. Adequate stocks are maintained.

COAL.—Coal, in moderate supply, is loaded from lighters to vessels at the wharves or in the stream.

WATER.—Water for drinking purposes and boiler use is obtainable at some of the wharves, but is usually supplied to vessels by water barge in any quantity at a rate of 160 tons per hour. About 400 tons can be supplied on a 24-hour advance notice. Drinking water should be boiled.

Advance notice of 48 hours is required for water and fuel and diesel oils.

REPAIRS.—Repairs to engines and above-water repairs to hulls are undertaken in the workshops and yards of the Dalla Dockyard, which is government owned and operated by the Inland Waterways Transport Board. The yard has an inoperative graving dock which has a floor length of 230 feet.

About 20 marine railways, with hauling capacities of 100 to 1,200 tons, are the only drydocking facilities available in the port.

A dockyard, maintained by the Burmah Oil Company for the repair of company small craft, is located at Syriam on the Pegu River. Facilities include a pier and 2 small marine railways with capacities of 40 and 100 tons, respectively.

In 1965 it was reported that a naval-merchant marine dockyard, located on the Rangoon River at Sinmalaik about 4 miles above Rangoon, was under construction.

Limited towing operations in the harbor can be undertaken by the Inland Waterways Transport Board. Two seagoing salvage tugs are available.

COMMUNICATIONS.—Rangoon is the southern terminus of the Burma Railways; two main highways lead northward from Rangoon to Mandalay and the interior.

Telephone and telegraph services are available. The municipal telephone system has long distance extensions to Mandalay, Moulmein, and Tavoy. Radiotelephone service with Thailand, Malaysia, and Japan is possible.

A radio station is open to public correspondence. Navigational warnings and weather reports are broadcast from Rangoon.

There is regular sea communication with all the large ports of India; irregular sea communication with Penang, Singapore, Hong Kong, Ceylon, and Japan is available.

Inland waterways comprise an important means of communication within Burma. Local river steamers proceed to Mandalay and beyond to Bhamo, 800 miles from the sea.

An international airport is located at Mingaladon, about 13 miles from the center of Rangoon.

MEDICAL.—Rangoon has extensive hospital facilities which includes a hospital to which seamen are admitted.

Medical advice is given via radio; see H.O. Pub. 117B. Quarantine reports are handled via radio. Sanitary regulations are enforced.

Smallpox, cholera, plague, and typhoid are endemic to Burma.

Deratting and Deratting Exemption Certificates are issued at Rangoon.

THE IRRAWADDY RIVER

6A-53 The navigable length of the Irrawaddy River and its branches totals about 800 miles from the sea to Bhamo. An intensive traffic is carried on by native craft and by river craft of varying draft belonging principally to the Inland Waterways Transport Board. This traffic is facilitated by the rise of the river due to seasonal heavy rains.

Ocean vessels, as a rule, proceed no farther than the ports of Bassein and Rangoon where the industrial and maritime activities of the entire region converge. The waterways beyond these ports are not described.

NAVIGATION.—Changes in the channels, the depths, and the velocity and direction of the current are so frequent and so marked that navigation of the Irrawaddy River is always complicated. For example, different routes between the same two river towns often exist; the route is selected only after considering the draft and length of the craft and the season of the year, dry or rainy.

Craft with drafts of 4 feet can reach Bhamo at all seasons; craft with drafts of 6 feet can reach Thayetmo. The passage was once accomplished in July by a vessel drawing 10 feet 2 inches.

PILOTAGE.—The frequent fluctuations of the river can be closely followed only by the

local pilots, of which many are natives. Each pilot is qualified for a portion of the river about 65 miles long. They are considered trustworthy.

TIDES AND TIDAL CURRENTS.—The tidal influence is observed as far as Danubyu, about 70 miles from the coast.

The seasonal rise of the river begins in March and attains its maximum height in September. At Prome, 318 miles above Rangoon, the mean high level is about 34 feet above the dry season level. The rise varies, but as a rule the rise below Prome is somewhat less and above Prome it is somewhat more than the mean high level.

The average velocity of the river current is 3 knots in portions of the river above the limit of the tidal influence. At some points it is 5 to 6 knots and at Akauktaung (18°25'N., 95°11'E.) a velocity of 7 1/2 knots has been recorded in August.

INLAND CITIES AND TOWNS—DISTANCES.—MANDALAY (21°59'N., 96°08'E.), about 350 airline miles northward of Rangoon, is the headquarters of the division and district of Mandalay as well as the chief city of Upper Burma. Mandalay is connected to the railway and telegraph systems; river steamers communicate regularly with the city.

The following table gives the names of the more important cities and towns on the waterway and the distances by river.

	Miles
Rangoon to Thayetmo	305
Thayetmo to Minhla	46
Minhla to Yenangyaung	40
Yenangyaung to Pagan	42
Pagan to Myingyan	40
Myingyan to Mandalay	65
Mandalay to Kabwet	56
Kabwet to Myadaung	70
Myadaung to Modah	45
Modah to Bhamo	53
Rangoon to Bhamo; total	762

GULF OF MARTABAN—COASTAL FEATURES

6A-54 The Gulf of Martaban lies northward of an imaginary line between Baragua Point (sec. 6A-25) and Kalegauk Island (sec. 6B-28). Kalegauk Island lies about 135 miles eastward of Baragua Point. The gulf is relatively shallow throughout; the 10-fathom curve roughly coincides with the imaginary line between Baragua Point and Kalegauk Island. Regular depths within the 10-fathom curve decrease gradually northward towards the shore and the mouth of the Sittang River.

Anchorage in the Gulf of Martaban is discussed in section 6A-26.

The coast east-northeastward of the entrance of the Rangoon River to the mouth of the Sittang River is low and fronted by an extensive shallow bank of mud and sand. This area is noted on the chart as very dangerous. See section 6A-31.

PART B. SITTANG RIVER TO THE TAVOY RIVER

SITTANG RIVER ENTRANCE (16°50'N., 96° 55'E.)

6B-1 The entrance of the Sittang River lies at the head of the Gulf of Martaban. Depths at the head of the gulf and in the entrance of the river are not charted, but are known to be shallow and dangerous. Only native craft enter the river; canals within the entrance connect the river with the inland waterway system.

A dangerous bore sweeps up the Sittang River at spring tides and is often followed by an equally dangerous choppy sea of water mixed with sand. An enormous quantity of silt is contained in the waters discharged by the Sittang River.

COAST—GENERAL

6B-2 The coast eastward of the entrance of the Sittang River and that part of the coast which fronts the Gulf of Martaban south-southeastward to the entrance of the Moulmein River is low and alluvial. From the entrance of the Moulmein River south-southeastward to abreast of Kalegauk Island, the balance of the coast, which fronts the Gulf of Martaban, for the most part is low, interspersed with a few high places and scattered hills of less than 1,000 feet in height.

In the vicinity of the entrance of the Ye River the hills become more numerous and

mountain ranges begin to parallel the coast, which is bold in places. Southward of the Ye River to Heinze Chaung, peaks, some of which are conspicuous, rise from the ranges which parallel the coast.

South-southeastward of Heinze Chaung to the entrance of the Tavoy River, coastal ranges, with prominent peaks, continue to parallel the coast. Between Maungmagan Bay and Tavoy Point the coast is bold, rocky, and broken by many small indentations.

DEPTHS—DANGERS

6B-3 Depths and dangers inside the 10-fathom curve and discussed in this part are described in detail with the coastal features and landmarks; Ross Sand (sec. 6B-4) is the only exception.

Depths of 6 to 10 fathoms lie off the coast between the southwest shore of Bilugyun Island (sec. 6B-10) and the north end of Kalegauk Island (sec. 6B-28).

Between Kalegauk Island and Tavoy Point (sec. 7A-1) the 10-fathom curve lies at distances of about 11 miles to less than 1 mile offshore.

From a position about 10 miles westward of the entrance of Heinze Chaung (sec. 6B-37) the 20-fathom curve is charted in a very irregular pattern to the westward. Towards the Gulf of Martaban, depths of less than 20 fathoms lie northward of the curve.

Between Heinze Chaung and Tavoy Point the 20-fathom curve lies at distances of about 7 to 24 miles offshore. All the off-lying islands and dangers between Bilugyun Island and Tavoy Point lie inside the 20-fathom curve.

OFF-LYING DEPTHS AND DANGERS

6B-4 Livermore Shoal (sec. 6B-30) Headlam Patch, Shearme Sand, and Ross Sand lie in a wide arc of about 25 miles and are the outermost shoals in the approach to the Ye River.

HEADLAM PATCH (15°08′N., 97°38′E.) with a least depth of 6 1/2 fathoms, lies about 8 1/2 miles west-southwestward of Pagoda Point (sec. 6B-30). This patch is about 2 1/2 miles long, north and south, and about 1 mile wide.

SHEARME SAND, with a least depth of 6 fathoms, lies about 12 3/4 miles southwestward of Pagoda Point. The sand is about 5 1/2 miles long, north and south, and about 3/4 mile wide.

ROSS SAND, with depths less than 6 fathoms, lies for about 9 miles southward of a position about 5 miles westward of Da That Island (sec. 6B-31). The sand is about 1 mile wide in places with a least depth of 1 3/4 fathoms over its north part, which is usually marked by discolored water and tide rips. Soundings give little warning in the approach to Ross Sand. Depths of 7 to 10 fathoms lie for a distance of 5 3/4 miles south-southwestward of the south end of Ross Sand.

A ridge, with depths of 6 1/2 to 10 fathoms, lies for a distance of about 10 miles southward of a position about 3 miles northwestward of the north end of Ross Sand. The ridge is about 1 mile wide with its north end lying between Ross Sand and Shearme Sand. A depth of 10 fathoms lies about 3 miles eastward of Shearme Sand.

SINCLAIR SHOAL, with least depths of 5 fathoms lying about 26 miles westward of White point (sec. 6B-36), is about 5 miles long, north and south, and 1 1/2 miles wide. Patches with depths of 9 and 10 fathoms lie 1 1/2 miles southward and 3 miles westward, respectively, of the southwest end of Sinclair Shoal.

A 10-fathom patch lies about 6 miles west-southwestward of the north end of Kalegauk Island.

A sunken WRECK, position approximate, lies in depths of 13 to 14 fathoms about 13 miles westward of Hope Point (sec. 6B-29).

A dangerous sunken WRECK lies about 3 3/4 miles west-northwestward of Pagoda Point (sec. 6B-39), located on the south side of Maungmagan Bay. Another sunken WRECK lies about 8 miles south-southwestward of Pagoda Point.

Several patches with depths of 10 fathoms lie in about the middle of Moscos Channel between Launglon Bok North Island (sec. 6B-5) and the mainland.

OFF-LYING ISLANDS

MOSCOS ISLANDS

6B-5 The Moscos Islands comprise three groups of uninhabited islands which are

Heinze (North Moscos) Islands, Maungmagan (Middle Moscos) Islands, and Launglon Bok (South Moscos) Islands. The islands lie in a chain parallel with the mainland coast for a distance of about 42 miles with North Island, the northernmost island of the Heinze Islands, located about 14 miles south-southwestward of Kandaung Promontory (sec. 6B-37). The Moscos Islands lie within the 20-fathom curve and are mostly steep-to on their west sides.

HEINZE (NORTH MOSCOS) ISLANDS.—North Island (14°28'N., 97°47'E.), 455 feet high, is the northernmost island of this group. Rocks, 28 feet high, lie 1/2 mile north-northeastward of North Island.

North Patch, which dries 8 feet, lies about 2 miles northward of North Island. North Ledge is discussed in section 6B-39.

East Ledge, which dries 15 feet, lies about 1 1/2 miles eastward of North Island.

Heinze Bok (Long Island), 1,025 feet high and about 2 miles southward of North Island, is the largest of the Heinze Islands. Two islands and some above-water rocks lie between Heinze Bok and North Island. Reef Islet, 169 feet high, lies about 1 1/2 miles eastward of the south end of Heinze Bok; a rock, with a depth of less than 6 feet, lies close southward of Reef Islet.

Bok Ye-gan (Quoin Island), 1,177 feet high and the southermost of the Heinze Islands, lies about 6 1/2 miles south-southeastward of Heinze Bok. Two islets lie within 1 mile off the northeast side of Bok Ye-gan; four islets lie between Bok Ye-gan and Heinze Bok.

MAUNGMAGAN (MIDDLE MOSCOS) ISLANDS.—Four densely wooded islands comprise the Maungmagan Islands. Sabyat Kyun (Neatstongue Island) 390 feet high, lies about 3 3/4 miles south-southwestward of Bok Ye-gan. North Island, 1,210 feet high and the largest of the Maungmagan Islands, lies about 1 mile southward of Sabyat Kyun. Pasut Kyun (Baby Island) 260 feet high, lies about 1/2 mile southeastward of the middle of the southeast side of North Island. South Island, 1,015 feet high, lies about 3/4 mile southeastward of the south extremity of North Island.

Kyauk Butaung (Birdsnest Rocks), 70 feet high, and Nghetthaik Taung (Cradle Rocks), 365 feet high, lie about 3 miles eastward of North Island.

MAUNGMAGAN PASSAGE.—This channel, about 11 1/2 miles wide with depths of 13 to 23 fathoms, lies between Maungmagan Islands and Launglon Bok Islands.

LAUNGLON BOK (SOUTH MOSCOS) ISLANDS.—The three principal islands of the group are North Island (Atek Bok), 871 feet high, Hngetthaik Kyun, 440 feet high, and South Island (Auk Bok), 1,186 feet high. They lie close to each other in a north and south direction. Atema Kyun (North Button Island), 58 feet high, lies close off the east side of North Island in a position about 1 1/4 miles southeastward of the north extremity of the island. Kama Kyun (South Button Island), 65 feet high, lies close off the east side of South Island and east-northeastward of the island's summit. All of the islands are densely wooded.

Kyaukpyu Kyun, a jungle-covered rocky islet, 160 feet high, lies about 1 mile southeastward of the south extremity of South Island. A LIGHT is shown from Kyaukpyu Kyun.

South Ledge, which dries about 15 feet, lies about 3/4 mile southward of the south extremity of South Island.

ANCHORAGES.—Anchorage in bad weather is recommended eastward of Maungmagan Islands in depths of 9 to 12 fathoms between Nghetthaik Taung and South Island and in 9 to 10 fathoms eastward of Sabyat Kyun.

Anchorage is also afforded eastward of North Island of the Launglon Bok Islands in depths of 12 to 14 fathoms with Atema Kyun bearing 350°.

6B-6 MOSCOS CHANNEL.—Moscos Channel lies between the three groups of the Moscos Islands and the mainland to the eastward of them. Depths in the fairway range from 10 to 20 fathoms, except at the north end eastward of North Ledge (sec. 6B-39) and North Patch (sec. 6B-5), where the depths are less than 10 fathoms.

NAVIGATION

6B-7 Vessels approaching the entrance of the Moulmein River from the westward should pass 6 to 8 miles southward of Sanda Light Vessel (sec. 6A-26) in depths of 14 to 16 fathoms and then steer to make Double Is-

land (15°52'N., 97°35'E.). Double Island (sec. 6B-26) should be passed a convenient distance to the westward and kept bearing less than 153° until the lighthouse (sec. 6B-18) on Green Island bears 048° when the outer anchorage should be steered for on that bearing.

During March when the land near the entrance of the Moulmein River is seldom seen from a greater distance than 1/2 mile, a landfall must be made well southward of the entrance and a position off Double Island ascertained before shaping course for the river entrance.

In clear weather and often on a bright-moonlight night, the high mountains on the mainland eastward of Double Island may be sighted before the lighthouse or the light on Double Island.

In thick weather and during the Southwest Monsoon, the land a little southward of Kalegauk Island (sec. 6B-28) should be made if the position of the vessel is doubtful. In bad weather, particularly at or near spring tides, vessels should not proceed to the anchorage off Amherst, but should pass inside of Kalegauk Island and anchor in Bentinck Sound (sec. 6B-28).

When proceeding from Rangoon to the entrance of the Moulmein River in fine and clear weather, the lofty peak of the Zingyaik Range (sec. 6B-10) and the high land of Bilugyun Island and of Sin Taung (sec. 6B-17) may all be identified. In thick weather, especially during February, March, and April, it is advisable to make the land between Button Island and Setse Yele Paya (sec. 6B-25).

Vessels frequently run aground on Bilugyun Sands in fog as a result of being too far northward of the landfalls mentioned for approaches in thick weather. Soundings do not give warnings of the near approach to the banks, rocks, and shoals which border the east shore of the Gulf of Martaban.

When proceeding from Rangoon to Moulmein, great care should be exercised to allow for the strong tidal currents.

For a distance of about 10 miles southward of Dolphin's Nose (sec. 6B-37), vessels should not approach within 7 miles of the coast. The depths are less than 5 fathoms. Farther southward a closer approach to the coast may be made abreast Luce Hill and Sieve Hill (sec. 6B-39).

Vessels transiting Moscos Channel (sec. 6B-6) during the day should pass eastward of North Ledge (sec. 6B-39). At the south entrance of the channel, vessels should not pass between Kyaukpyu Kyun and South Ledge (sec. 6B-5).

TIDAL CURRENTS

6B-8 Between the entrance of the Rangoon River and the Moulmein River, the flood current sets toward and into the Sittang River. On the Rangoon side of this area the set is north-northeastward and northward; on the Moulmein side the set is north-northwestward. The general direction of the flood current in other parts of the Gulf of Martaban is north-northeastward. It becomes more northerly as the east shore is approached; within a distance of 10 miles it parallels the shore. The ebb current in all parts of the gulf sets almost invariable in a direction opposite to that of the flood current. The velocities of the tidal currents at springs increase from 2 to 3 knots in depths of over 20 fathoms to from 6 to 7 knots in 16°15'N., 97°00'E. During and immediately after the Southwest Monsoon the duration and velocity of the ebb current are increased and those of the flood current are decreased. The duration of slack water at springs does not usually exceed 1/2 hour.

In the approaches to the entrance of the Moulmein River the flood current sets northward along the coast. The ebb current at first sets west-southwestward and then southward. The velocity of the ebb current is considerable as a result of the flow from the rivers Sittang and Moulmein.

In the vicinity of Double Island the flood current sets northward and the ebb southward. The velocity at springs is 4 1/2 knots and at neaps 2 knots. The tidal currents turn about 1/2 hour later than at Amherst Point.

Tidal currents attain velocities of 3 knots at springs in the channel between Hnetthaik Kyun and the mainland westward of Tavoy Point.

WINDS—WEATHER

6B-9 See section 5-3.

COASTAL FEATURES—LANDMARKS

6B-10 The coast eastward of the entrance of the Sittang River is low and backed by the Zingyaik Mountain Range, which roughly parallels the coast about 9 miles inland north-

ward of Bilugyun Island. Pagodas stand on the northernmost summits which have the greatest elevations.

As the mountains rise a considerable distance from navigable depths, their value as landmarks are reduced accordingly. On a clear day, however, they are visible from a distance of more than 50 miles.

BILUGYUN ISLAND (16°23′N., 97°31′E.), about 17 miles long and 8 miles wide, has on its north part a range of wooded hills which attain heights up to nearly 600 feet. Several isolated lower hills rise in the south part of the island. Steep-to shoals front the west side of the north part of the island as far as 4 to 5 miles offshore. TOUZOUN POINT and an unnamed point about 3/4 mile eastward of Tounzoun Point are the southernmost extremities of Bilugyun Island.

THE MOULMEIN (SALWEEN) RIVER

6B-11 The Moulmein River has its source in unexplored country eastward of Tibet and follows a southerly course for several hundred miles. Together with numerous tributaries it drains a vast area and flows into the Gulf of Martaban between the south end of Bilugyun Island and the mainland. The Martaban (Darebauk) River branches off from the Moulmein River opposite the city of Moulmein and flows into the gulf between the north end of Bilugyun Island and the mainland. The Martaban River is not navigable.

MOULMEIN RIVER TO MOULMEIN (16° 29′N., 97°37′E.)

6B-12 THE ENTRANCE OF THE MOULMEIN RIVER lies between Tounzoun Point (sec. 6B-17) and Amherst Point (16°05′N., 97°34′E.), located about 9 miles southward of Tounzoun Point.

The port of Moulmein, about 26 miles above and northward of the river's entrance, lies opposite of the northeast extremity of Bilugyun Island.

NAVIGATION—LENGTHS AND DRAFTS

6B-13 The river is generally navigable from the sea to Moulmein by vessels drawing 13 feet at high water neaps and 23 feet at high water springs. The greatest draft which has been carried by a vessel to the port is 26 feet 3 inches. The maximum draft of a vessel which could be handled in October of 1964 was 23 feet 8 inches.

In 1962 it was reported that the length of vessels entering the port was limited to 450 feet if a single-screw vessel and 475 feet if a twin-screw vessel. A 1964 report states that a vessel with a length of 500 feet could reach Moulmein.

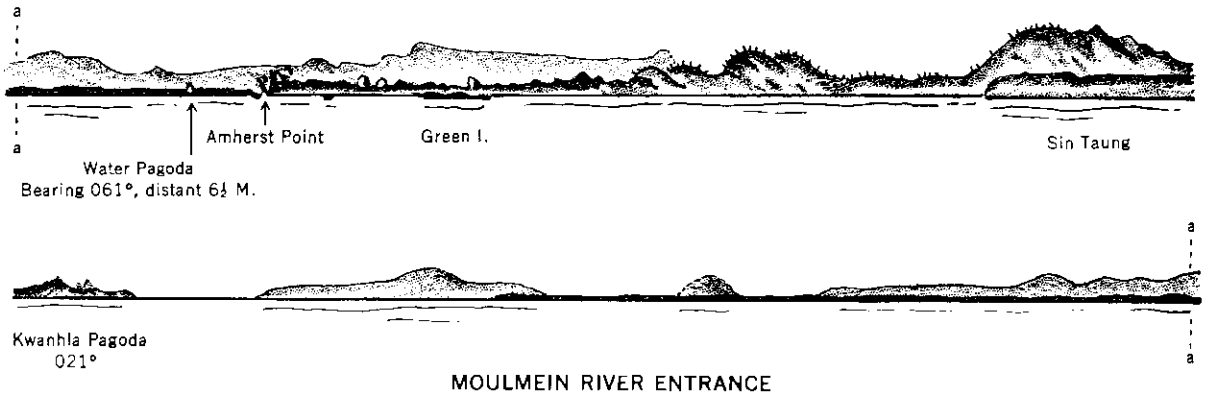
The navigable depth available is related to the power of the vessel; because of strong cross-channel currents, the deepest channel is not always available to vessels not capable of 10 knots speed.

Entrance into the river at night is not permitted; entrance without a pilot should not be attempted.

The maximum sailing drafts from Moulmein during the monsoon season, May to September, vary from 15 feet 3 inches to 24 feet 4 inches. During the dry season, October to April, they vary from 11 feet to 22 feet 9 inches.

WINDS—WEATHER

6B-14 From July to September the weather is stormy. In December, January, and February the winds are light and the weather is fine. The mornings and evenings of days in January are misty; towards the end of the month the weather becomes foggy. Fogs become thick and frequent toward the end of February and throughout March. During this interval they last at times for 3 or 4 days



MOULMEIN RIVER ENTRANCE

and obscure even the banks of the river.

When the natives burn waste-paddy straw, dense smoke further reduces visibility accordingly.

Rainfall is heavy between May and September.

See the Appendix for a table of meteorological data for Amherst.

STORM SIGNALS.—Storm and weather signals in accordance with the Indian General System are displayed from the port office flagstaff. See section 1-34.

TIDES—TIDAL CURRENTS

6B-15 Tides at Amherst Point and Moulmein are semidiurnal.

Tides in the river to the port of Moulmein are subject to large diurnal inequalities and seasonal variations.

TIDE GAUGES stand in the following positions: Near the landing about 1/2 mile east-northeastward of Amherst Point; on the east bank of the river about 7 miles north-northeastward of Amherst Point; off the west side of New Kingyaung Island; in the west side of the river off the point at Nathmaw; off the east bank about 1/2 mile south-southwestward of Mupon Pagoda; and off the port office at Moulmein.

These gauges are painted in red, black, and white bands which comprise a 6-foot section. To the top of the red band is 6 feet and to the top of the white band is 3 feet. Each band is 1 foot high; the 2-foot black bands between the red and white bands have narrow white lines across the middle, marking two equal divisions of 1 foot each.

Each bar in the river has its own particular tide gauge which is moved as the bar shifts.

The zeros of the tide gauges are set to the level of Indian Spring Low Water.

A TIDAL SEMAPHORE, 80 feet high and painted red, stands on the west bank of the river at Nathmaw about 1 mile west-southwestward of the south end of Yele Kyun. It is visible from the south end of Amelia Crossing about 2 miles eastward of the south extremity of Hintha Kyun. Another SEMAPHORE, 50 feet high and painted white, stands at Thetkaw on the west bank about 2 miles above Nathmaw. It is visible from southward from abreast the north part of Hintha Kyun and from northward from the berths off Mupon.

The system is the same as the one used in the Karnaphuli River (sec. 4C-20) and registers the rise of the tide during daylight hours.

TIDAL HEIGHTS ABOVE *CHART DATUM.—Amherst: MHWS 20 feet, MLWS 0.0 feet; MHWN 14 feet, MLWN 6.4 feet. *B.A. Chart 1845.

Moulmein: MHWS 13.9 feet, MLWS 2.0 feet; MHWN 8.3 feet, MLWN 1.6 feet (low water falls about 4.3 feet below mean sea level). *B.A. Chart 1646.

Mean river level at Moulemin is highest in September when it is 9 feet above chart datum and lowest in March when it is 4 feet above the datum.

TIDAL CURRENTS.—In the offing abreast Amherst, the flood or northgoing current commences about 1/2 hour after low water at Amherst Point; the ebb or southgoing current commences about 1/2 hour after high water. The velocity of the current is 3 3/4 knots at springs and 2 knots at neaps. The interval of slack water is very short.

Off the entrance of the Moulmein River the flood current sets towards Longstones Reef; when the outer banks are covered it sets strongly eastward or northeastward over the sands.

Off Green Island during the dry season the flood current commences at the time of low water at Amherst and the ebb current commences 1 hour after high water at Amherst.

During the dry season the velocity of the river current is 3 knots. In the rainy season the velocity is higher; during August the rains raise the level of the river 26 to 28 feet and a velocity of 7 knots is attained.

At Anchoring Creek, on the east side of the river abreast the south end of Hintha Kyun, the flood current commences 2 hours and 20 minutes after low water at Amherst; the ebb current commences 1 hour and 30 minutes after high water at Amherst.

At Nathmaw the flood current commences 3 hours and 10 minutes after low water at Amherst and the ebb current 1 hour and 40 minutes after high water at Amherst.

The durations of the flood and ebb tidal currents at Amherst are the same the year round. At Moulmein the approximate duration

of the flood current is 4 hours and of the ebb current 8 hours from October through January; from February through May the ratio is 5 hours flood and 7 hours ebb. During June, 3 hours flood and 9 hours ebb and from July through September there is no flood current except at maximum springs.

DEPTHS—DANGERS

6B-16 Considerably less water than charted is reported to exist in the approaches to the entrance of the Moulmein River.

After every monsoon, marked changes are observed; alterations in the arrangement of the channel and the river banks occur and the bars are often found in new positions with altered depths over them.

The entrance of the Moulmein River is greatly encumbered by extensive sandbanks and reefs.

Drying banks of mud and sand, with shoals with depths of 3 fathoms and less on the seaward side of them, lie within a distance of about 3 3/4 miles south-southwestward of Tounzoun Point. Similarly, the above dangers lie about 3 and 4 miles westward and west-northwestward, respectively, of Tounzoun Point.

BILUGYUN SANDS, which dry from 2 to 6 feet in places, occupy much of the middle of the entrance and are separated from the shoals southward of Bilugyun Island by a channel. This channel is sometimes narrow and shallow and at other times it is wide and deep at which time it forms the main entrance of the river. Bilugyun Sands are steep-to on their seaward side; soundings give no warning when approaching them. There has been no recent survey in this vicinity.

GOODWIN SANDS, which dry to 10 feet, lie in the south side of the entrance of the river on the east side of Bilugyun Channel and almost fill the area between the channel and the east bank, northward to northeastward of Amherst Point.

BILUGYUN CHANNEL, the main entrance channel, lies between Bilugyun Sands and Goodwin Sands. A least depth of 15 feet (MLWS) was charted in Bilngyun Channel in 1964. A shoal depth of 14 feet was reported (1964) to lie a little more than 3 1/2 miles northwest by north of Green Island.

LONGSTONES REEF, with its outer edge nearly 2 miles northwestward of Amherst Point, consists of detached drying and sunken rocks and rocky patches with depths of less than 3 fathoms. A rocky patch with a depth of 2 2/3 fathoms lies about 2 1/4 miles northwestward of Amherst Point.

Sunken rocks with depths of less than 1 fathom, formerly identified as The Patch, lie about 1 3/4 miles west-northwestward of Amherst Point and about 1/2 mile south-southwestward of the outer edge of Longstones Reefs. Depths of 3 fathoms and less surround these sunken rocks within a radius of 1/2 mile.

A stranded WRECK, visable at about half tide, lies on the south side of Longstones Reef.

DEVILS HORN, a rock which dries to 12 feet, lies between Longstones Reef and Amherst Point and about 1 mile northwestward of the latter. Foul ground, drying rocks, and shoal patches with depths of less than 3 fathoms lie within 1 mile westward to northwestward of Amherst Point.

Except at slack water, the channels between the rocks should not be attempted without local knowledge, even by boats.

GREEN ISLAND (16°04′N., 97°33′E.) located 1 mile south-southwestward of Amherst Point, is surrounded by drying and sunken rocks and shoal depths of less than 1 fathom. Because of these dangers an approach to Green Island closer than 1/2 mile is dangerous.

A rocky patch, with a depth of 4 1/2 fathoms, lies about 2 1/2 miles west-northwestward of Green Island.

AMHERST POINT and the shore in the vicinity of the point are reef-fringed up to a distance of about 1/4 mile. For several miles southward of Amherst Point reefs fringe the coast and extend about 1/2 mile offshore in places. Shoal depths of less than 3 fathoms lie up to about 1 mile offshore along this stretch of the coast.

FISHING STAKES are charted about 5 miles west-northwestward of Tounzoun Point.

ASPECT—LANDMARKS—CHANNELS

6B-17 TOUNZOUN POINT (16°14′N., 97° 32′E.), on the north side of the entrance, is

the south extremity of a ridge about 1/2 mile long which slopes toward the point from a height of about 170 feet. KWANHLA PAGODA, a good landmark, stands on a hill with an elevation of 183 feet, about 1 1/4 miles northeastward of Tounzoun Point. Two other pagodas stand on a 160-foot high hill on the south coast of Bilugyun Island, about 3/4 mile eastward of Tounzoun Point.

AMHERST POINT, on the south side of the entrance, is a 60-foot high bluff on which stands an old pagoda. WATER PAGODA, a conspicuous building, stands on piles on a drying reef about 200 yards north-northwestward of Amherst Point. Another pagoda, surrounded by water at half tide, stands near a cliffy point, 40 feet high, about 1 mile southward of Amherst Point. SIN TAUNG, a wooded hill 934 feet high about 4 3/4 miles southeastward of the point, is conspicuous when observed from the westward.

AMHERST VILLAGE situated just within Amherst Point has communication with Moulmein by telegraph and motor highway. A landing place at Amherst is located on the north shore of the village, about 1/3 mile east-northeastward of Amherst Point.

GREEN ISLAND, covered with trees and brush, lies about 3/4 mile offshore; the lighthouse serves as an aid in identifying the island.

During March the land near the entrance of the Moulmein River is seldom visible from a distance greater than 1/2 mile.

The various channels and crossings between Bilugyun Channel and the port of Moulmein are readily subject to change and as a result no detailed description is contained herein.

In 1961 the entrance of Bilugyun Channel was located about 3 miles northwestward of Amherst Point. In 1964, due to Bilugyun Sands shifting position, the entrance channel was farther northward and reported to be in an estimated position about 7 miles north-northwestward of Amherst Point. Thence within the entrance in 1961 the navigable channel passed eastward of Hintha Kyun (Long Island), a large island in the river with its south extremity about 3 1/2 miles east-northeastward of Tounzoun Point, and westward of New Kingyaung Island which lies eastward of the middle of Hintha Kyun. Continuing northward it passed westward of Shwetaung Kyun (New Island), located about 1 mile eastward of the north part of Hintha Kyun, and westward of Yele Kyun (Mupon Island) which lies with its south end about 2 1/2 miles northward of Hintha Kyun.

NAVIGATIONAL AIDS

6B-18 KYAIKKAMI (KYAIK-KHAME) LIGHT is shown from Green Island.

THAN LWIN (GOODWIN) LIGHT FLOAT is moored near the entrance of Bilugyun Channel, about 3 miles northwestward of Green Island. The position of the light float is subject to change without notice; mariners are warned not to close within a distance of 2 miles of the light float without a pilot.

BUOYAGE.—When entering the Moulmein River red conical buoys indicate the east or starboard side of the channel and black can buoys indicate the west or port side of the channel.

The buoys are numbered consecutively from seaward; on each buoy is painted the initial letter of the channel it marks. The buoys are unreliable.

ANCHORAGES

6B-19 OUTER ANCHORAGE.—A vessel anchored in a position with the lighthouse on Green Island bearing 090°, distant 2 miles, will be in the best anchorage with shelter from the strong spring ebb current during freshets. The depths in this anchorage average 10 fathoms, mud, with good holding ground.

RIVER ANCHORAGES AND MOORINGS.—There are anchorages at several places in the river. Vessels must moor as they cannot lie at single anchor.

Halfway Anchorage can accommodate two 500-foot vessels in a depth of about 21 feet at two swinging mooring buoys. During the Southwest Monsoon the use of these buoys is prohibited from May to September. The anchorage is at the north end of Long Island Channel and eastward of the south point of Hintha Kyun.

Deep-draft vessels moor off Nathmaw, about 3/4 mile southwestward of the south extremity of Yele Kyun.

Mupon Anchorage lies off Mupon Pagoda and

about 1 1/4 miles northward of the north extremity of Yele Kyun.

Moulmein Anchorage, off the city of Moulmein, has four mooring buoys.

Kaladan Anchorage lies off the north part of the city.

PILOTAGE—PILOTS—EXPECTED TIME OF ARRIVAL—SIGNAL STATION

6B-20 Pilotage is compulsory for merchant vessels of over 200 tons displacement.

The pilot station is located on Amherst Point. If arranged for in advance, a pilot is available on display of the usual day signal or by a blue light at night. Entrance into the river at night has been discontinued.

Vessels should send their ETA, draft, and speed about 24 hours before arrival to Port of Moulmein via Rangoon Radio. The pilot must travel to Amherst by cutter or car. There is no pilot vessel.

Pilots will board vessels in the vicinity of the outer anchorage, westward of Green Island. It is advisable to arrive at the anchorage 2 hours before time of high water at Amherst and anchor while awaiting the pilot. In 1964 one pilot and the Port Officer were available.

PILOT BEACON.—A pilot beacon, 16 feet high, which is a wooden mast with a white corrugated-iron topmark, stands about 300 yards southwestward of Water Pagoda. A LIGHT is shown from the beacon which is for the use of pilots only.

SIGNAL STATION.—A signal station is located on Amherst Point; flags of the International Code of Signals are displayed from a flagstaff.

QUARANTINE REGULATIONS

6B-21 There shall be no communication between any vessel, which is liable under Quarantine Regulations to display the International Code of Signals flag L, and the shore or any other boat or vessel, except to receive the pilot and his servant and baggage, until permission is granted in writing by the Health Officer.

If there is a suspected case of plague on board or if more than two deaths from any cause have occured during the voyage, the pilot anchors the vessel in Halfway Anchorage to await the Health Officer; in other cases vessels are anchored in the lower end of Mupon Reach.

Vessels which have, within a period of two months immediately preceding their arrival, started from or touched en route at a port infected with yellow fever, or communicated, except orally without contact or by signal, with a vessel which is either infected with yellow fever or which has left a port infected with yellow fever within that period, shall be allowed to anchor only at the outer anchorage westward of Green Island.

MOULMEIN HARBOR

6B-22 MOULMEIN HARBOR comprises a 4-mile section of the river from Mupon Pagoda northward to Battery Point. MUPON PAGODA (Mupon Large Pagoda) stands on the east bank about 1 1/2 miles north-northeastward of the north extremity of Yele Kyun. Mupon Small Pagoda stands close northward of Mupon Large Pagoda. The breadth of the river in the harbor which is unencumbered by dangers and available to shipping is from 300 to 1,000 yards.

DEPTHS—DANGERS—BUOYS.—In 1964 charted depths in the harbor in the middle of the channel, other than the depths over Fairway Rocks and Town Rock, ranged from 14 to 41 feet (MLWS). Silting is a problem.

MUPON REEF lies close off the east bank of the river and nearly 1/2 mile northward of Mupon Pagoda. Patches of rock on this reef dry about 2 feet at low water during the dry season, February and March. A red conical BUOY is moored about 200 yards north-northwestward of Mupon Reef.

SIRROCCO ROCK, with a least depth of 8 feet, lies on the east side of the channel a little more than 1 mile northward of Mupon Pagoda and about 800 yards off the east bank. A red conical BUOY marks Sirrocco Rock.

A ROCK, with a depth of 5 feet, lies on the east side of the channel about midway between Mupon Reef and Sirrocco Rock and about 3/4 mile northward of Mupon Pagoda.

Rocky, foul ground is charted about 1/4 mile northeastward of Sirrocco Rock.

FAIRWAY ROCKS, with a least depth of 7 feet, lies in midchannel about 600 yards north-northwestward of Sirrocco Rock. A

ROCKY PATCH with a depth of 16 feet lies midway between Sirrocco Rock and Fairway Rocks.

WALES ROCK, with a depth of 3 feet, lies about 250 yards off the east bank in a position a little more than 1 1/2 miles northward of Mupon Pagoda. A ROCKY PATCH, with a depth of 11 feet, lies about 250 yards west-northwestward of Wales Rock.

CASTLE ROCKS, with a depth of 16 feet over their outer edge about 200 yards off the east bank, lie in a position centered about 1/2 mile southward of the Port Office, which is located about 2 3/4 miles northward of Mupon Pagoda. Closer to the bank, depths of 1 foot and 2 feet are charted over the south end of Castle Rocks.

TOWN ROCK, with a least depth of 6 feet, lies near midchannel about 1/3 mile southwestward of the Port Office. A red conical BUOY marks Town Rock.

A SUNKEN ROCK and depths of less than 6 feet lie up to 100 yards off the east bank about 400 yards north-northwestward of the Port Office.

A REEF lies close to the east bank about 1/4 mile southwestward of Battery Point, located at the north end of the city. Depths of less than 6 feet surround the reef and front the shore in the vicinity of Battery Point.

A WRECK lies standed in a position about 1 mile westward of the pagoda on Gaungze Kyun (Crow Island), which lies about 1/4 mile northward of Battery Point. A green conical BUOY is moored close southeastward of the wreck.

HARBOR BEACON stands on the west bank of the river opposite Tavoy Jetty.

Black can BUOYS mark the west side of the channel in the harbor.

FACILITIES

6B-23 MOULMEIN, Burma's third-largest city and third-ranking port, serves as the chief commercial and administrative center of the Tenasserim Division, of which Amherst District is a part thereof with headquarters at Moulmein. The city, situated on the east bank of the river, had an estimated population of about 116,000 in 1963.

The port is under the general supervision of the Nautical Advisor and Principal Officer, Mercantile Marine Department of the Ministry of Transport and Communications. The Port Officer and the District Commissioner, aided by a local Port Advisory Board, operate the port.

An esplanade fronts the city along the principal wharf area. The Port Office and the Customs Office face the river from across this esplanade.

Exports consist mainly of rice, rubber, and timber.

BERTHS.—The port has about 1,000 feet of principal wharfage which consists mostly of small pontoons and finger piers.

Mission Street (Tavoy) Jetty, a pontoon wharf with a length of 176 feet and an alongside low-water depth of 14 feet, is located about 2 1/2 miles northward of Mupon Pagoda. An alongside depth of 16 feet was reported in 1963.

Main (Salween) Wharf, a finger pier, about 300 yards northward of Mission Street Jetty, has a 45-foot berthing face at its outer end and a depth of 8 feet alongside.

Moulmein Railway Jetty, a pontoon wharf about 700 yards northward of Main Wharf, has a length of 150 feet and a depth of 13 feet alongside. This facility is primarily a ferry landing.

Kaladan Railway (Big Bazaar) Jetty, a pontoon wharf about 700 yards northward of Moulmein Railway Jetty, has a length of 112 feet and a depth of 4 feet alongside. River craft use this facility.

Numerous single-pontoon jetties, with depths ranging from 2 to 11 feet alongside, are located between Mupon Pagoda and Battery Point. These are available to river vessels.

MOORING BUOY BERTHS.—Four mooring buoys in midchannel in the harbor accommodate vessels at free-swinging berths. One mooring is capable of accommodating a vessel with a length of 400 feet and a draft of 19 feet and another a vessel with a length of 450 feet with a similar draft.

ANCHORAGE BERTHS.—There is an anchorage berth at Mupon Anchorage for a vessel with a length of 450 feet and a draft of 20 feet.

At Kaladan Anchorage off the north part of the city a berth will accommodate a vessel with a length of 400 feet and a draft of 23 feet.

222-679 O - 66 - 19

TUGS.—Several small tugs of limited horsepower are available for handling barges and lighters.

CARGO INFORMATION.—Ocean and large coastal vessels handle cargo in the stream, using their own gear. Lighters are available. General cargo is transferred at several of the jetties.

Mechanical handling facilities in the port are meager. A fixed steam crane on the outer end of Main Wharf is reported to be inoperative. A 1964 report lists two 5-ton capacity cranes and a mobile 10-ton capacity crane for the port with special arrangements having to be made for lifts in excess of 5 tons.

When draft of a vessel limits the amount of cargo that can be loaded, topping off is accomplished in Rangoon. Vessels calling at Moulmein are generally small in size in order to avoid this topping-off operation.

DECK AND ENGINE SUPPLIES.—Deck and engine supplies are limited.

FUEL OIL.—Moulmein is not a bunkering port.

COAL.—Coal is obtainable from limited stocks.

WATER.—Water for drinking and boiler use may be procured from a 2 1/2 " pipeline at Mission Street Jetty; water is also piped to Kaladan Railway Jetty. A 120-ton water barge, with a delivery rate of 20 tons per hour, supplies vessels in the stream. Water for drinking purposes should be boiled.

REPAIRS.—Small repairs are undertaken. A marine railway in the port is capable of drydocking a vessel of 100 tons. The naval base has a small marine railway.

COMMUNICATIONS.—Moulmein is connected with the main railroad and telegraph systems. Railroad, vehicular, and passenger ferry services are maintained between Moulmein and Martaban; the Inland Waterways Transport Board maintains services to various locations along the rivers.

An airfield is located at the southeast edge of the city; daily air transportation to Rangoon is available.

MEDICAL.—There are several hospitals in the area, one of which will accept seamen.

MARTABAN

6B-24 MARTABAN, situated on the opposite bank across the river from Moulmein, is located about 2 miles northward of Battery Point.

The river port serves as a railhead and a ferry-transshipment point. Four wharves within the harbor include a railway jetty and a passenger wharf. Depths in the harbor area are suitable only for river craft.

COASTAL FEATURES—LANDMARKS (CONTINUED)

6B-25 FROM AMHERST POINT TO BLUFF POINT (15°46'N., 97°42'E.), the north part of this section of the coast is high, rocky and indented, and marked by occasional cliffs. The south part of this section of the coast is low and covered with dense jungle.

Setse Yele Paya, a small island close to the coast, lies about 8 1/4 miles south-southeastward of Amherst Point. A pagoda, 70 feet high, stands on the island.

Button Island, 175 feet high and also close to the coast, lies about midway between Amherst Point and Setse Yele Paya. SIN TAUNG (sec. 6B-17) is a good mark from the westward along this coast, which is reef-fringed with shoal depths of less than 3 fathoms lying up to about 1 mile offshore in places.

BLUFF POINT, 330 feet high, is located about 12 1/2 miles south-southeastward of Setse Yele Paya. The coast between forms a bight into which several creeks flow and is low, except for a conspicuous point, 310 feet high, about 3 1/2 miles southeastward of Setse Yele Paya. A pagoda stands on a small reef, connected with the coast by drying flats, about 1 1/4 miles northward of Bluff Point. Drying sandflats extend up to about 1 3/4 miles offshore in the south part of the bight; depths of less than 3 fathoms lie up to about 2 1/4 miles offshore between Setse Yele Paya and Bluff Point.

ISLAND AND DANGERS

6B-26 DOUBLE ISLAND (15°52'N., 97°35'E.) lies about 12 1/4 miles southward of Amherst Point and about 6 1/2 miles westward of the coast. The island is steep-to on its west side; rocky ledges with depths of from 2 1/2 to 5 1/2 fathoms extend about 1 mile south-southeastward and about 1/4 mile northward and eastward of the island. On the east side of the island a landing place is lo-

cated close to a crane; landing is difficult in bad weather.

The channel between Double Island and the mainland is apparently clear of dangers. Less depths than charted have been reported to exist off Double Island; this vicinity should be navigated with caution.

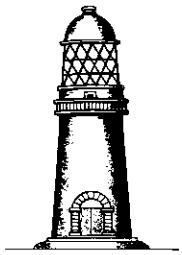
KWUN NGYE NAUNG (Kyun Nyi Naung) (DOUBLE ISLAND) LIGHT is shown from the summit of the island. Some of the trees on the island are the same height as the top of the lighthouse. If the light is seen to darken for a short interval, this fact should be reported at once. The lighthouse keepers, by this means, indicate that they require assistance; fever is prevalent on the island.

NORTH ROCKS consist of two groups of rocks which lie about 1 1/4 miles apart about 3 miles west-northwestward and a similar distance northwestward, respectively, of Bluff Point. A rock in the south group is about 20 feet high; the north group dries to 17 feet and covers at high water springs.

The channel between North Rocks and the mainland is unsafe; patches with depths of 4 1/2 and 4 3/4 fathoms lie northeastward and eastward of the north group.

COASTAL FEATURES—LANDMARKS (CONTINUED)

6B-27 PAGODA POINT, 150 feet high, is located about 8 1/2 miles southward of Bluff Point. Thick jungle to the water's edge covers the coast between the points; drying mud and sandflats fringe the coast to distances of about 1 mile offshore. The mouths of two creeks indent this section of the coast.



KWUN-NGYE-NAUNG (DOUBLE ISLAND) LIGHTHOUSE

EVANS RIDGE (Thabut Taung), a range of coastal hills, 300 to 420 feet high, extends 2 miles southeastward from a position 3 1/4 miles south-southeastward of Bluff Point.

PULAU KROPIK (Kakana Taung), an islet 180 feet high, lies about 4 1/2 miles southward of Bluff Point and about 3/4 mile offshore. Foul ground lies between the islet and the shore.

BENTINCK POINT (15°29'N., 97°44'E.) is a low point about 8 miles southward of Pagoda Point. The coast between the points continues jungle-covered and is fringed by shallow and drying flats to distances of about 1 1/2 miles offshore. This section of the coast is broken by the mouths of two creeks, one close southward of Pagoda Point and the other about 3 miles north-northeastward of Bentinck Point. A reef and sunken rocks extend about 1 mile northwestward from Bentinck Point.

PHAUNGKALA TAUNG (Symms Hill), 1,290 feet high and conspicuous, is the highest summit of an isolated range which rises about 6 miles east-southeastward of Pagoda Point.

WARA TAUNG (Sharp Hill), 1,550 feet high, rises about 8 miles east-southeastward of Bentinck Point; it is a useful mark for entering Bentinck Sound.

KYAIKHALAING PAGODA, 40 feet high, stands on a reef about 1 mile offshore and about 3 miles northward of Bentinck Point. A drying flat connects the reef with the mainland.

That part of the coast between Pulau Kropik and Bentinck Point lies on the east side of Bentinck Sound.

BENTINCK SOUND (15°35'N., 97°42'E.)

6B-28 BENTINCK SOUND lies with the mainland coast on its east side, and Galloper Sand, Kalegauk Island, and Cavendish Island on its west side.

GALLOPER SAND lies between a position about 1 3/4 miles west-northwestward of Pulau Kropik and a position about 4 miles west-southwestward of Pagoda Point.

KALEGAUK ISLAND, a 5 1/2-mile long island oriented in a north-south direction, lies with its south extremity about 5 miles westward of Bentinck Point. Portland Point is the north extremity of the island. MOUNT

WOODSTOCK (Kalegauk Summit) rises to 600 feet on the north part of the island and is a good landfall for vessels bound for Moulmein during the Southwest Monsoon. Kalegauk Island lies abreast the southern limit of the Gulf of Martaban.

CAVENDISH ISLAND, 320 feet high, lies about 1/4 mile southward of the south extremity of Kalegauk Island.

TIDAL CURRENTS.—In the northern entrance of Bentinck Sound the tidal currents attain a velocity of 5 knots and set across the channel. Inside the sound the velocities are 2 to 3 knots. The flood current sets on the inner side of Galloper Sand and the ebb current sets on the outer or seaward side.

DEPTHS—DANGERS—CHANNELS.—The depths range from 5 1/2 to 9 fathoms in the fairway of the north entrance of Bentinck Sound, which has a least width of 1,200 yards. The south entrance of the sound has depths of 7 to 9 fathoms and a width of about 3 miles.

A 2 1/2-fathom shoal lies on the east side of the north entrance of the sound a little more than 1/2 mile westward of the north end of Pulau Kropik.

Middle Ground, with a least depth of 4 1/2 fathoms, mud, lies in the middle of the north part of the sound and extends about 1 1/2 miles north-northwestward, with depths of 5 fathoms and less, from a position about 2 miles west-northwestward of Pagoda Point.

General depths over Galloper Sand are less than 3 fathoms and it dries in places.

There are depths of 6 to 15 fathoms in the narrow channel between the south end of Galloper Sand and the north end of Kalegauk Island.

Kalegauk Island is mostly steep-to outside the 5-fathom curve which in no place lies more than 1/2 mile offshore. The coasts of the island are cliffy, interspersed with small sandy bays and mangrove swamps.

The Peepers, two small rocks close together and 2 feet high, lie about 1 mile north-northwestward of the south extremity of Kalegauk Island and about 1/4 mile off the west shore of the island.

Rocks, which dry about 15 feet and are awash at high water springs, extend a short distance northeastward from Cavendish Island; other rocks, which dry 11 feet, extend a short distance south-southwestward from the island. A spit, with depths of less than 5 fathoms, extends nearly 1/2 mile southward from Cavendish Island.

A narrow channel, with depths of 5 3/4 to 8 fathoms, lies between the spit which extends southward from Cavendish Island and South Shoal to the south-southwestward of the island. South Shoal, with a least depth of 4 fathoms, is nearly 2 1/4 miles long in a north and south direction.

In 1945, an obstruction with a least depth of 2 1/4 fathoms, was reported to lie in an approximate position close eastward of South Shoal and about 1 1/4 miles southward of the south point of Cavendish Island.

ANCHORAGE.—The best anchorage, sheltered during the Southwest Monsoon, is in depths of 6 to 8 fathoms about 1/2 mile eastward of the middle of the east side of Kalegauk Island.

DIRECTIONS.—Without local knowledge, it is inadvisable for deep-draft vessels to enter the sound through the north entrance. There are not sufficient ranges to aid in making good a course against the strong cross-channel currents.

To enter by way of the north entrance, pass midway between the north extremity of Galloper Sand and the shallow water fronting the coast northward of Pulau Kropik by keeping the south end of Pulau Kroplik in range 128° with Phaungkala Taung. When the northernmost summit of Evans Ridge bears 078°, pass between Galloper Sand and Middle Ground by steering 182°, having consideration for the set of the flood current towards Galloper Sand and the set of the ebb current towards Middle Ground.

To enter Bentinck Sound by way of the south entrance, keep Wara Taung bearing not more than 078° until the east side of Kalegauk Island is open eastward of the east side of Cavendish Island, bearing about 002°. Course may then be shaped to the north-northeastward to pass 1 mile eastward of Cavendish Island, having regard for the dangers southward of the island.

COASTAL FEATURES—LANDMARKS (CONTINUED)

6B-29 HOPE POINT (15°21'N., 97°43'E.), located about 8 miles southward of Bentinck Point, is rocky with a small hill, 360 feet high, rising close within the point.

A bay indents the coast between Bentinck Point and Hope Point. Several creeks empty into the bay; sand and mudflats front the shore of the bay and dry in places as far as 1 1/4 miles offshore.

The coast, for about 6 3/4 miles southward of Hope Point to the mouth of a small creek, is cliffy and backed by densely-wooded hills. PALEIN, a peak 1,710 feet high, rises about 4 miles south-southeastward of Hope Point and is very conspicuous.

KOKUNYE KYUN (Aye Island), 460 feet high, lies 1 1/4 miles offshore about 3 1/4 miles south-southwestward of Hope Point. A 3 1/2-mile long, narrow shoal, with depths of less than 3 fathoms and parts of which dry up to 5 feet, lies between the north side of Kokunye Kyun and a position about 1/2 mile northwestward of Hope Point. Shoal ground, with a least depth of 2 3/4 fathoms, lies within an area up to a little more than 1/2 mile southward of the south side of the island.

TOBY ROCK lies nearly 3/4 mile offshore about 2 miles southward of the east extremity of Kokunye Kyun. Toby Rock dries to about 17 feet and is awash at high water springs; depths of 3 1/2 fathoms surround the rock to nearly 1/2 mile off.

From the mouth of the small creek, about 6 3/4 miles southward of Hope Point, to Pagoda Point about 3 1/2 miles farther south-southeastward, jungle forest backs a sandy beach.

APPROACHES TO THE YE RIVER

6B-30 PAGODA POINT (15°12'N., 97°46'E.), located on the north side of the entrance of the Ye River, should not be confused with the Pagoda Point on the east side of Bentinck Sound. Pagoda Point appears from the northwestward as a hummock at the end of a level stretch of beach. Rising steeply from the beach, the point, 151 feet high, is conspicuous. A pagoda, at an elevation of 191 feet, stands on the point.

SIDAW TAUNG, a bold headland, 577 feet high, located nearly 1 3/4 miles southeastward of Pagoda Point, marks the south side of the entrance of the Ye River. Sidaw Taung appears flat-topped when observed from the westward and northwestward and conical when observed from the southward.

DAMATHA TAUNG, a 518-foot high headland, is located about 9 1/2 miles southward of Sidaw Taung. The coast between Sidaw Taung and Damatha Taung is low and sandy with several small headlands and bights. High mountain ranges inland of the coast give it the appearance of being steep.

NAVIGATION.—There are no recommended passages between the islands and sands which extend southward and parallel the coast for about 22 miles from a position about 2 miles west-northwestward of Pagoda Point and terminate in Ross Sand (sec. 6B-4).

Soundings provide the best guide when passing seaward of Livermore Shoal as it lies just within the 10-fathom curve.

Pagoda Point bearing 117°, just open to the northeastward of Wa Kyun, leads to the northward and northeastward of Livermore Shoal.

TIDAL HEIGHTS ABOVE *CHART DATUM.—Sidaw Point: MHWS 14.9 feet, MLWS 2.1 feet; MHWN 10.5 feet, MLWN 6.5 feet. *H.O. Chart 3720.

TIDAL CURRENTS.—The flood tidal current in the vicinity of the entrance of the Ye River sets northward along the coast with a velocity of about 3 knots at springs. The ebb current sets southward with the same velocity. At springs, the water is discolored outside the islands.

ISLANDS—DEPTHS—DANGERS.—Numerous islands and shoals front the entrance of the Ye River. Most of the islands lie on extensive shallow banks.

LIVERMORE SHOAL, a 2 1/2-mile long ridge of hard sand in a north and south direction with depths of 2 to 5 fathoms, lies with the least depth about 5 1/2 miles westward of Pagoda Point.

WA KYUN (Stag Island) the northernmost of a chain of islands which lie off the entrance of the Ye River and south-southwestward of the entrance, lies nearly 2 miles westward of Pagoda Point. The northern summit, the higher of the two summits on Wa Kyun, is 444 feet high. The west side of the island is steep; a beach occupies the middle part of the east shore of the island. A spit, with depths of less than 3 fathoms, extends a little more than 3/4 mile north-northwestward from the north end of the island. Another spit, with similar depths, extends about 1/2 mile southeastward from the south end of Wa Kyun.

Depths of 5 fathoms and less lie up to 4 miles north-northwestward of Wa Kyun to a position about 3/4 mile west-northwestward of Toby Rock.

HNGETPYAW KYUN (Outer Island), 153 feet high, small and wooded, lies nearly 1 mile southwestward of the south end of Wa Kyun. Rocks, which dry about 18 feet and are awash

at high water springs, lie about 400 yards northwestward of the north point of the island. Depths of less than 5 fathoms lie up to about 1 mile northward and 1/2 mile northeastward of the north point of Hngetpyaw Kyun.

6B-31 NAT KYUN (Bath Bun Island) (15° 10'N., 97°44'E.), 444 feet high, lies about 1/2 mile southeastward of Hngetpyaw Kyun. A ridge of hard sand, which dries 3 to 4 feet, extends about 3 3/4 miles southward from the south side of Nat Kyun. Depths of 5 fathoms and less lie at distances up to 1 mile westward of the west side of this ridge and up to 3/4 mile eastward of the middle of the east side of the ridge. The sea breaks very heavily over the ridge.

A detached bank, which dries from 2 to 5 feet, lies with its north edge about 1/2 mile northward of Nat Kyun. This bank with the shoal which lies northward and northeastward of Hngetpyaw Kyun lies on the southwest side of the channel which separates these dangers from Wa Kyun. This channel has a least depth of 5 1/4 fathoms in the fairway, but it is not recommended.

A rock, which dries 3 feet, lies on the shoal ground between Hngetpyaw Kyun and Nat Kyun. The sea breaks over this shoal ground.

GHORPARAY ROCK, which dries about 3 feet, lies nearly 1/2 mile westward of the south extremity of Nat Kyun.

PASCOE SHOAL lies with its least depth of 1 foot in a position about 1 1/4 miles eastward of the east extremity of Nat Kyun. The shoal, with depths of less than 3 fathoms, is about 1 1/2 miles long and 1/4 mile wide and lies in a north and south direction. The channel eastward of the shoal has a least depth of 4 fathoms in the fairway.

KYETTAIK KYUN, 78 feet high to the tops of the trees, lies about 1 1/4 miles eastsoutheastward of the east extremity of Nat Kyun. Kyettaik Kyun is reef-fringed; a spit, with depths of less than 3 fathoms extends a little more than 1/4 mile south-southwestward from the south end of the island.

SIMPSON SHOAL has a least depth of 6 feet, sand and mud, in its center, located about 1 1/2 miles southward of Kyettaik Kyun. Simpson Shoal, lying in a north and south direction, is nearly 2 miles long and 1/4 mile wide with depths of less than 3 fathoms. The east extremity of Nat Kyun in range 352° with the southwest extremity of Wa Kyun leads through the south part of the channel between Simpson Shoal and the drying ridge of sand which extends southward from Nat Kyun. The channel eastward of Simpson Shoal and Pascoe Shoal is preferred. Kyettaik Kyun bearing 351°, and open westward of the high land near the coast northward, leads eastward of Simpson Shoal.

KYUNGYI (Pig Island) lies with its north end about 4 1/2 miles southward of Nat Kyun. The island, 2 1/2 miles long, consists of four distinct, wooded hills which are joined by low sandy beaches. The southernmost hill attains a height of 534 feet, the highest elevation of the island. The northernmost hill, 250 feet high, is 1 3/4 miles northward of the southernmost hill.

Shoal ground, with depths of less than 3 fathoms, lies up to about 1 1/2 miles westward of Kyungyi. At the outer edge of this shoal ground, about 1 3/4 miles west-northwestward of the southernmost hill on Kyungyi, the sea breaks continually over shallow sands which lie southward for about 2 3/4 miles from the above-mentioned position. A shoal area about 6 miles long and about 1 mile wide, with depths of less than 3 fathoms, encompasses the shallow sands; the south end of this shoal area lies about 4 1/2 miles south-southwestward of the south end of Kyungyi.

Depths of 4 to 10 fathoms lie eastward of Kyungyi and towards the mainland for a distance of about 2 miles, providing a good channel and a secure anchorage.

DA THAT (TAMARIND) ISLAND, 260 feet high, is a small island which lies about 1 1/2 miles offshore and about 4 3/4 miles south-southeastward of the 534-foot hill on Kyungyi. The island is on the east side of the southern approach channel; the same is true of MAGYI (HOARE) ISLAND, 145 feet high and about 3/4 mile offshore, which lies about 3 1/4 miles south-southeastward of Da That Island. Several small islets lie close southward of Magyi Island.

6B-32 ANCHORAGES.—Anchorage is afforded in the channel between Kyungyi and the mainland in depths of 9 and 10 fathoms with the north end of Kyungyi bearing 328°, a little less than 1 mile distant.

Anchorage is also afforded in the channel eastward of Wa Kyun in depths of 6 1/2 fathoms, mud, with the north extremity of the island bearing 299° and the south extremity of the island bearing 215°.

Eastward of Pascoe Shoal there is an anchorage in 5 to 6 fathoms with the east extremity of Kokunye Kyun in range 339° with the west extremity of the mainland, located about 3 3/4 miles south-southeastward of the east extremity of Kokunye, and Kyettaik Kyun bearing 212°.

6B-33 DIRECTIONS.—If approaching from the northward, steer to pass 1 1/2 miles westward of Kokunye Kyun after sighting Kalegauk Island. When Wa Kyun is sighted steer 147° for the north summit of the island. When Pagoda Point bears 129° and is in range with the west slope of Sidaw Taung and with a dip in the distant high land, steer for the point. This course leads about 300 yards northward of the shoal which lies northward of Wa Kyun. When the east extremity of Nat Kyun is open eastward of the east side of Wa Kyun and bears about 190°, change course south-southeastward for the anchorage eastward of Wa Kyun.

To arrive at the anchorage eastward of Pascoe Shoal, maintain the 129° course for Pagoda Point until the east end of Kokunye Kyun is in range 339° with the west extremity of the mainland, located about 3 3/4 miles south-southeastward of the east end of Kokunye Kyun. Then change course south-southeastward, keeping the range astern, and steer for the anchorage. Note that the charted anchorage position is about 2 1/4 miles from the position where the stern range is picked up.

If approaching the entrance of the Ye River from the southward, steer 000° for Kyungyi passing westward of Magyi Island and eastward of Ross Sand (sec. 6B-4). When Da That Island bears 045°, steer to pass midway between Kyungyi and the mainland. Pagoda Point in range 004° with a notched peak, 2 1/2 miles to the northward of the point, leads eastward of Simpson Shoal to a position off the entrance bar of the Ye River, eastward of Pascoe Shoal.

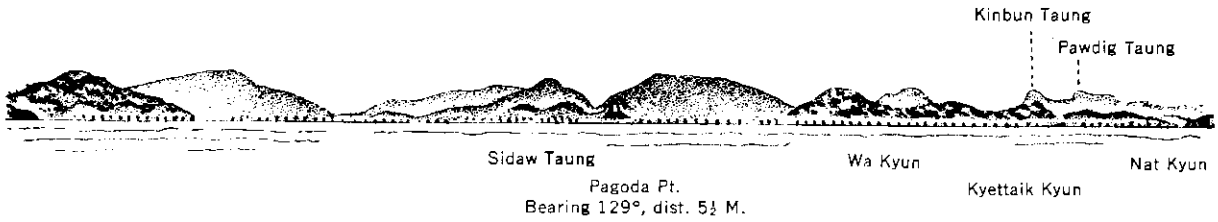
THE YE RIVER (15°11'N., 97°47'E.)

6B-34 THE YE RIVER enters the Bay of Bengal between Pagoda Point and the west extremity of Sidaw Taung. Sidaw Point, on the south side of the entrance, is about 1/2 mile northeastward of the west extremity of Sidaw Taung. The town of Ye is located about 8 miles above and northeastward of the entrance of the river.

The navigable channel of the river lies southward of Sonma Kyun, a large island about 2 miles within the entrance. The river from its entrance to the town follows a winding course; many of its bends are so abrupt that only short vessels can negotiate them. Local knowledge is required.

DEPTHS.—The bar nearly dries and can be crossed by vessels only at high water. At springs, a vessel drawing 13 feet might reach the town; at neaps, the maximum draft is less than 7 feet.

6B-35 YE (15°15'N., 97°51'E.), a town with an estimated population in excess of 12,000 (1953), is situated on high ground on the north bank of the river. The pagodas, which stand in the town, are good landmarks. Ye has a wooden pier. Rice, fish, and vegetables are procurable. Regular sea communication with other Burmese ports is maintained. The town is connected by railway with Moulmein. During the rainy season, from about the middle of May to the middle of November, fever is prevalent.



ENTRANCE OF YE RIVER FROM NORTHWESTWARD

COASTAL FEATURES—LANDMARKS (CONTINUED)

6B-36 Southward of Damatha Taung for a distance of 9 miles to WHITE POINT (14°52′N., 97°48′E.), high land rises from several miles inland to close within the coast in the vicinity of White Point. PAWDI TAUNG (Krounangye Peak) has an elevation of 2,590 feet about 7 miles northeastward of White Point. KINBUN TAUNG (North Peak), 2,540 feet high, is about 1 1/2 miles northward of Pawdi Taung. Several other peaks in this vicinity make the above-named peaks difficult to identify. A shallow bight indents the coast between Damatha Taung and White Point.

From White Point to Dolphin's Nose, located about 11 miles south-southeastward of White Point, the coast is bold and rocky. A mountain range, with elevations of 1,000 to 2,080 feet, parallels and rises close inland of the coast between White Point and Dolphin's Nose.

HEINZE CHAUNG (HEINZE BAY) (HEANZAY BASIN) (14°43′N., 97°54′E.)

6B-37 HEINZE CHAUNG is an estuary formed by the confluence of three large creeks which flow to the sea between high hills. The funnel-shaped estuary is about 4 miles long, and 3/4 mile wide at its narrowest part.

DOLPHIN'S NOSE, the seaward point on the north side of the entrance of Heinze Chaung, rises to an elevation of 1,000 feet. Other hills on the same side of the estuary attain heights up to 1,480 feet.

KANDAUNG PROMONTORY, an isolated hill 420 feet high and located about 1 3/4 miles south-southeastward of Dolphin's Nose, is the seaward extremity on the south side of the entrance.

The shores of the estuary, with the exception of a few rocky points, and the mouths of the creeks are fringed with mangroves. Kwethongyima, a jungle-covered low peninsula, lies between the mouths of the two creeks which enter the estuary from the northward. Fish Trap Point, on the south side of the estuary, is southward and nearly opposite of Kwethongyima. East Point, on the south side of the estuary at its narrowest part, is located about 3 miles northeastward of Kandaung Promontory.

TIDAL HEIGHTS ABOVE *CHART DATUM.—Heinze Chaung: MHWS 12.7 feet, MLWS −0.3 feet; MHWN 8.1 feet, MLWN 4.3 feet. *H.O. Chart 3754.

TIDAL CURRENTS.—The currents in the approaches to Heinze Chaung turn from 2 1/2 to 3 1/2 hours after high and low water at Mergui. In the offing, the flood tidal current sets northward parallel with the coast and the ebb current sets in the opposite direction. At the entrance of the northern channel the currents also set parallel with the coast.

Outside South Sands, the tidal currents set across the bar and through the southern channel until the sands are covered, when they set slightly across them at velocities estimated at 1 1/2 to 3 knots.

In the entrance of Heinze Chaung, the flood current commences about 1 1/2 hours after low water at Mergui and has a velocity of from about 3/4 knot to 1 3/4 knots. The ebb current commences about 1 1/4 hours after high water at Mergui and has a velocity of from 1 knot to 3 knots. Inside the entrance, the flood current commences about 3/4 hour after low water at Mergui and the ebb current commences at about the same time that it does in the entrance.

The observations upon which these statements are based were made during the dry season. During the rainy season, the ebb current will be considerably stronger, perhaps even to the point of overcoming the flood current.

DEPTHS—DANGERS.—Vessels drawing up to 25 feet can enter Heinze Chaung at high water springs and vessels drawing 18 feet can enter at high water neaps. Local knowledge is a necessary requirement.

No attempt should be made to cross the entrance bar unless the channel has first been thoroughly examined and buoyed to mark it.

NORTH SANDS, with general depths of less than 2 fathoms and which dry in places, ex-

tend about 4 3/4 miles south-southwestward from the coast between Dolphin's Nose and a position on the coast about 2 miles west-northwestward of Dolphin's Nose. POSITION ROCK, which dries 14 feet and is awash at high water springs, lies near the inner edge of North Sands about 1/2 mile southeastward of Dolphin's Nose.

SOUTH SANDS, also with general depths of less than 2 fathoms and which dry in places, extend about 3 1/2 miles south-southwestward from Kandaung Promontory.

The 3-fathom curve, seaward of the entrance bar, lies about 5 miles southwestward of Dolphin's Nose and about 4 1/2 miles southwestward of Kandaung Promontory.

The entrance bar lies between the outer part of North Sands and South Sands. In the outer part of the bar the depths are fairly uniform; on the inner side of the bar between the sands there are shoal patches which are surrounded by deepwater.

6B-38 CHANNELS.—Shoal patches on the bar separate the entrance into two channels, the northern and the southern, which in the past had least depths of 13 feet.

The southern channel passes close along South Sands and of the two channels it has less shallow water to be crossed. It is about 200 yards wide at its narrowest part. Shoals limiting the channel are steep-to; at the strength of the tides they are marked by tide rips.

ANCHORAGES.—An anchorage outside the entrance westward of North Sands, with Dolphin's Nose bearing between 080° and 102° about 3 miles distant, has depths of 4 1/2 fathoms.

Anchorage may be obtained anywhere in the estuary after passing Kandaung Promontory. In the south side of the estuary the depths are more convenient and the tidal currents are weaker.

A good anchorage in the estuary with depths of about 7 fathoms, mud bottom, lies about midway between Kwethongyima and Fish Trap Point.

The estuary is usually closed to shipping during the Southwest Monsoon. Small craft navigate the creeks for short distances. The area is sparsely populated.

COASTAL FEATURES—LANDMARKS (CONTINUED)

6B-39 FROM HEINZE CHAUNG for a distance of about 55 miles south-southeastward to PAZIN KYUN (Oyster Island) (13°48'N., 98°04'E.) (sec. 6B-40), the coast, for its greater part, lies on the east side of Moscos Channel (sec. 6B-6). Mountain ranges back this section of the coast.

The Moscos Islands (sec. 6B-5) comprise an archipelago which fronts a considerable part of this coast.

The mouth of a creek lies about 16 miles south-southeastward of Kandaung Promontory. This creek, which flows between two mountain ranges that back the coast, connects with the inner part of Heinze Chaung.

Between Kandaung Promontory and the mouth of the creek, depths of 5 fathoms and less lie at distances of 1 1/2 to nearly 7 miles offshore.

NORTH LEDGE, a rock 3 feet high and within the 10-fathom curve, lies about 6 1/2 miles offshore in a position about 9 1/2 miles south-southwestward of Kandaung Promontory. A 3 1/4-fathom patch lies about 1/2 mile northeastward of the rock; foul ground lies between them.

A dangerous sunken WRECK is charted about 4 1/4 miles westward of the mouth of the creek which lies about 16 miles south-southeastward of Kandaung Promontory.

TAPIR HILL, densely wooded, with a height of 1,212 feet, is located about 3/4 mile inland and 5 1/2 miles south-southeastward of Kandaung Promontory. MIDDLE HILL, 1,683 feet high and also densely wooded, rises about 2 1/2 miles east-southeastward of Tapir Hill. Several miles eastward of the range which extends about 7 miles southward from Middle Hill, another mountain range, with higher elevations, parallels the coast. YETAGUN TAUNG (Allen Peak), 2,970 feet high and conspicuous, is in the center of the latter range, about 7 1/2 miles southeastward of Middle Hill. PAUNGCHON TAUNG (Nabule Punkhun),

3,830 feet high, marks the south end of the range, about 5 1/2 miles southward of Yetagun Taung. Paungchon Taung appears blunt when viewed from the westward, but is seen as a sharp peak when observed from the southward.

LUCE HILL, 2,315 feet high, and SIEVE HILL, 2,415 feet high, both densely wooded, are located about 1 1/2 and 2 miles east-southeastward, respectively, of the mouth of the creek which connects with Heinze Chaung. FALSE A PEAK, 1,460 feet high and densely wooded, is about 1 1/2 miles inland and about 2 1/2 miles west-southwestward of Paungchon Taung. Another densely wooded hill, A PEAK, 1,360 feet high and close within FENTON POINT (14°18'N., 98°00'E.) marks the south end of the coastal ranges to the northward. A PAGODA stands close southeastward of Fenton Point.

MAUNGMAGAN BAY indents the coast between Fenton Point and Pagoda Point, located about 13 1/2 miles south-southeastward of Fenton Point. The shore of the bay is low, sandy, and fringed with mangroves. A ridge backs the shore of the bay at distances inland of 4 1/2 miles at its north part and 1 1/2 miles at its south part. Taungbadaung, a peak with a height of 1,582 feet, rises on the south part of the ridge about 3 1/2 miles east-northeastward of Pagoda Point. Bungalows and pagodas stand on this section of the coast.

An OBSTRUCTION, with a depth of 2 fathoms, lies about 1 3/4 miles offshore in a position about 5 3/4 miles north-northwestward of Pagoda Point. A dangerous sunken WRECK lies about 2 miles offshore in a position nearly 4 miles north-northwestward of the point. A rock, awash, lies nearly 1 1/2 miles northward of Pagoda Point.

Mountain ranges continue close within and parallel with the coast for 16 1/2 miles southward from Pagoda Point to Pazin Kyun. Several islets lie close off this stretch of the coast, which for the most part is rocky with numerous small indentations. Letkat Taung, 1,966 feet high, is located about 10 miles southward of Pagoda Point. A pagoda stands on the summit of Letkat Taung.

6B-40 PAZIN KYUN (Oyster Island) (13° 48'N., 98°04'E.), 477 feet high, lies about 3/4 mile off the mainland. The island appears as part of the mainland when viewed from the westward.

6B-41 FROM PAZIN KYUN TO TAVOY POINT (sec. 7A-1) located on the west side of the entrance of the Tavoy River and about 17 miles south-southeastward of Pazin Kyun, the coast is rocky, broken, and bold. Coastal ranges continue southward close inland of the coast; several ranges, which are lower than those to the northward, attain elevations well over 1,000 feet on the south part of this section of the coast.

NYAW-BYIN AW (Nyawbyin Bay), the largest of several bays which indent this coast, lies about midway between Pazin Kyun and Tavoy Point. Wa Maw (Nyawbyin Point) marks the south side of the entrance of the bay. A large fishing village is situated on the south shore of the bay, close within Wa Maw. Depths in the bay shoal gradually to the flats which fringe the shore.

KYAN-EIK (Kyanak) TAUNG, about 3 miles southward of Wa Maw, rises to an elevation of 1,280 feet.

THAN MAW, about 5 1/2 miles southward of Wa Maw, is an extremity on the west side of MYINKWA AW, a bay which is open to the southward and indents the south coast of the peninsula between Than Maw and a position 1/2 mile westward of Tavoy Point. Depths in Myinkwa Aw are greater than 3 fathoms outside a distance of 1/2 mile from the head of the bay.

HNGET-THAIK KYUN (Cap Island), 523 feet high, lies about 1/2 mile offshore southward of Than Maw, and about 2 miles westward of Tavoy Point. The island is steep-to on its west side; depths of less than 5 fathoms lie up to nearly 1/2 mile eastward of the east side of the island. A depth of 4 1/4 fathoms, rocky bottom, lies about 400 yards southward of Than Maw, otherwise the channel between Hnget-thaik Kyun and the mainland is clear and deep.

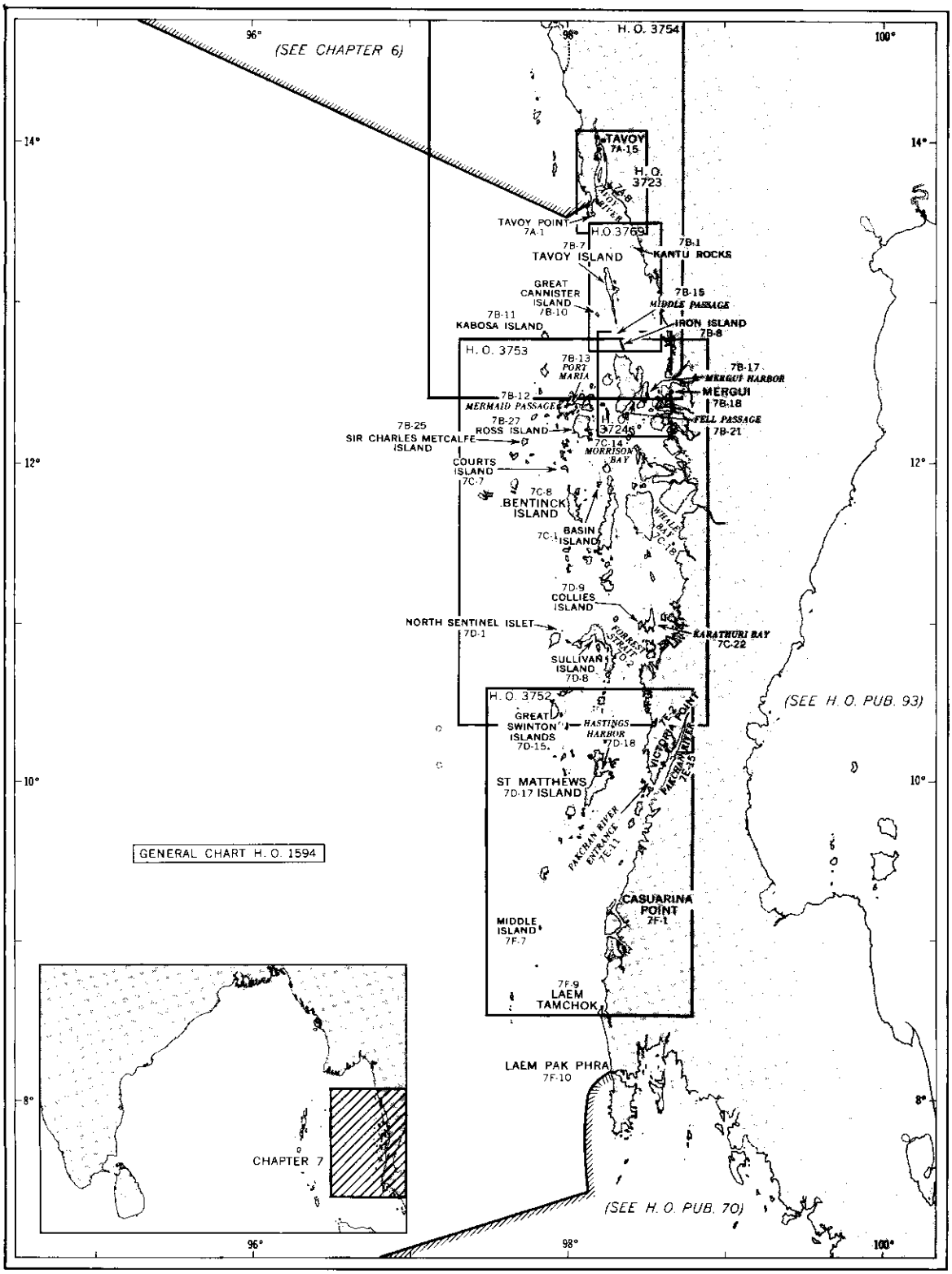


Chart limits shown are of the best scale charts issued to naval vessels by the U. S. Naval Oceanographic Office.
Numbers refer to the section in the text describing a designated locality.

CHAPTER 7—GRAPHIC INDEX

CHAPTER 7

COASTS OF BURMA AND THAILAND—TAVOY ENTRANCE TO KO PHUKET, INCLUDING MERGUI ARCHIPELAGO

Part A. TAVOY RIVER AND APPROACHES—TAVOY ENTRANCE TO MERGUI ISLAND.
Part B. MERGUI HARBOR AND APPROACHES—NORTH END OF BENTINCK ROUTE.
Part C. BENTINCK ROUTE AND ADJACENT COASTS.
Part D. FORREST PASSAGE AND STRAIT—ISLANDS AND BANKS WESTWARD AND SOUTHWESTWARD.
Part E. PULO MAH PUTEH TO CASUARINA POINT—PAKCHAN RIVER AND APPROACHES.
Part F. CASUARINA POINT TO LAEM PAK PHRA.

PLAN.—Tavoy River and its approaches are first described. Thence the north or deep-draft, approach to Mergui Harbor, and the harbor itself, are described. Information on the south approach to Mergui Harbor is then given. The remainder of the Mergui Archipelago, and the coast of the mainland which it fronts, along with the inner routes are then described in parts and sections. The arrangement is from north to south.

GENERAL REMARKS

7-1 The coast of Burma, between Tavoy Point (13°32′N., 98°10′E.) and Victoria Point, is indented by many mangrove-filled inlets, at the heads of which are meandering tidal streams. The shores consist of extensive mangrove swamps, and mudflats, with a few areas of rocky headlands and several short, narrow beaches. The latter consist of sand and mud, or sand and coral. Many mountain ranges parallel the coast. The only ports of any importance along this entire coast are Tavoy and Mergui.

The Pakchan River, which rises in about 10°50′N., 99°00′E., and which is about 80 miles long, forms the boundary between Burma and Thailand. Victoria Point (9°58′N., 98°33′E.) forms the north entrance point of the river.

The coast of Thailand, between the entrance of the Pakchan River and the entrance of Takua Pa Inlet, is mostly low, densely wooded, and is intersected by many rivers and creeks. It has not been closely examined. A range of mountains backs this coast. A number of islands, many surrounded by reefs, lie off this coast; others are joined to the mainland by sandbanks. Takua Pa Inlet is formed by a large river which flows into the sea by way of four channels between the parallels of 9°15′N. and 8°52′N.

The coast, between the south entrance of the Takua Pa Inlet and the north entrance of Chong Pak Phra, is fairly regular and is fronted by the Similan Islands. Chong Pak Phra is the narrow strait between the coast and Ko Phuket, a large island to the southward. The west coast of the latter island is indented by several open bays. The north part of this coast, with the exception of a small area, is low, wooded and backed by hills of moderate elevation. The south part rises steeply to a mountain range from about 860 to 1,700 feet high, densely wooded and sloping gradually northward and southward.

The Mergui Archipelago, which consists of approximately 1,000 islands ranging in size from mere hummocks of rock to King Island, the largest of the group with an area of about 175 square miles, lies within the 50-fathom curve. The archipelago extends from Tavoy Island, the north extremity of which is nearly 20 miles southward of Tavoy Point, to Similan Islands, a distance of about 285 miles. Great Western Torres Islands, the outermost islands, lie about 70 miles off the mainland. Some of the islands have mountain peaks which attain a height of 2,500 feet. The outer islands are steep and wooded; the nearshore islands are low and covered with jungle. There are no ports of significance, but there are many well-sheltered anchorages.

NAVIGATION

7-2 The track from Rangoon to Singapore leads well offshore of this coast and outer islands. It passes about from 10 to 12 miles westward of the Similan Islands.

The channels between the outer islands have

not been closely examined. The only recommended entrance channels from seaward, which lie between Sir Charles Metcalf Island (12°18'N., 97°47'E.) and Ko Chan (Sindarar Nua, 9°25'N., 97°51'E.), are Nearchus Passage (sec. 7B-26), Forrest Strait (sec. 7D-2) and Investigator Channel (sec. 7D-16).

A well-sheltered inner route, which may be used by vessels having local knowledge, leads from the Tavoy River to the Pakchan River. The best route leads westward of Domel Island (sec. 7C-9) and Bushly Island, about 2 miles southwestward of Domel Island, thence through Forrest Strait (sec. 7D-2), and thence eastward of Hasting and St. Mathew's Islands.

WINDS AND WEATHER

7-3 The climatic seasons of the Tenasserim Coast and the west coast of Thailand are based on two major wind systems, namely the Northeast Monsoon and the Southwest Monsoon, each with its own weather characteristics.

The Northeast Monsoon, which is associated with the Northern Hemisphere winter, extends from early December through late March. This is the dry season, but a flow of warm moist air from across the South China Sea covers the before-mentioned coasts and causes somewhat higher cloudiness, occasional thunderstorms, higher temperatures, and humidities than over the remaining areas. The greatest contrasts are in November, December and January when these coasts are hot, humid and rainy. Thunderstorms reach their lowest frequency during the Northeast Monsoon. Temperatures reach their lowest values, except at some stations along these coasts where all seasons are about equally warm and humid. Cloudiness is at a minimum with the lowest averages usually occurring in January. Visibilities are usually good, but there is some early morning fog.

The spring intermonsoon season, usually from mid- March to mid-May, is the period in which the dry northeast winds give way to the moist southwest winds. Weak and variable winds occur in April and May. There is a slight increase in rainfall in April and a big increase in May. Thunderstorm frequencies rise sharply, and are most frequent during May. Temperatures reach their maximum values in April. Relative humidities and cloudiness increase.

The Southwest Monsoon, which extends from mid-May through late September, is the rainy season. Daily intermittant light rain, interspersed with occasional heavy rainstorms or thunderstorms accompanied by torrential downpours, occur. Cloudiness reaches a maximum during the Southwest Monsoon. Maximum cloud cover reaches 80 to 95 percent. Temperatures decrease slightly at most places due to the increased cloud cover. The average daily temperatures are in the upper 80 or low 90 degrees. Relative humidity reaches its highest values. Visability is usually good. Poor visibility occurs mainly during heavy rain squalls.

The autumn intermonsoon season is normally limited to the months of October and November. During this period the moist southwesterly monsoon is replaced by moist easterly winds over these coasts. Weak and variable winds, with land and sea breezes prevailing, occur until the Northeast Monsoon is established. Rainfall decreases, but thunderstorms increase slightly over these coasts. Temperatures and relative humidity remain high. Cloudiness decreases, except over the south part of the Tenasserim coast and the west coast of Thailand. Periods of low visabilities are rare.

TIDES—CURRENTS—TIDAL CURRENTS

7-4 The tides along the Tenasserim coast and along the west coast of Thailand are semidiurnal with a small diurnal inequality in both time and height. The tides approach these coasts from the south-southwestward and progress northward. The mean spring ranges increase from about 10 feet at the Burma-Thailand border to over 17 feet at Mergui.

The currents flow at an average rate of 0.4 knot with a maximum of about 0.7 knot. The set and drift of the currents in local areas often varies from the patterns shown below. This is due to frequent storms. Near the coast, the tidal currents will also exert great influence and will either augment or deter the non-tidal currents.

The currents along the Tenasserim coast