the well. Wood may be cut near the bar, on the banks of the river. The anchorage in the road is not always safe in the N.E. monsoon, when a gale from that quarter may be liable to happen from Sept. to Feb.; but in the S.W. monsoon it is safe. Ships generally anchor to the N.W. or W. of the reef, with the entrance of the river about S., the Friar's Hood S.S.W., a vessel being distant about 1½ m. from the river's entrance, abreast of a cluster of rocks projecting from the shore to the N. of the river.

Her Majesty's ship *Terpsichore*, at anchor in 8½ fathoms, off shore about 1¾ m., had the Friar's Hood nearly in one with the entrance of Baticolo River, and the Sugar Loaf W. by N.; a rock even with the water's edge S.W. by W.; the N. extreme of land about N.W. by N.; and the S. extreme S.E. ½ S. At the distance of 2½ m. E. by S. ½ S. from the ship, **a rock** was found with 12 ft. water on its shoalest part, on the deepest part 3½ fathoms, being a cable's length in extent, and lies N.E. ½ E. 2 m. from the entrance of the river. A little outside of it, there are 9 and 10 fathoms clear ground, and close-to, 8 fathoms; on the inside, close to it, from 5 to 7 fathoms rocky bottom. By keeping the notch in the grove open, and distant from the shore not less than 2 m., you will be clear of the danger. From the rock, the Friar's Hood bore S.W. by S., the entrance of the river W. by S. ½ S., Sugar Loaf W. by N., and the notch in the grove just shut in, bearing S. About a mile S.E. by E. ½ E. from the ship, and rather more than a mile from the shore, 20 ft. water was found on a shoal, which joins to a coral bank stretching 3 or 4 m. parallel to the shore, having uneven ground on it from 4 to 7 fathoms. In coming from the S., be careful to keep the notch, or two groves of cocoa-nut trees, open, until the Friar's Hood bears S.S.W., then you may run in with safety, crossing the coral bank in 6 and 7 fathoms; continuing to steer in toward the shore, you will deepen to 8½ and 9 fathoms: there the ground is composed of coarse brown sand, with small broken shells; the entrance of Baticolo River will then be open, bearing S.S.E.; by night, to clear all these shoal-patches, do not come under 24 fathoms, keeping the lead going, and by day you may borrow to 19 fathoms about 3 m. off shore.

Venloos, or Vendeloos Bay, or Inlet, in lat. 7° 58½′ N., lon. 81° 32½′ E., bears from the entrance of Baticolo River N.N.W. ½ W., distant 5½ leagues: the coast between them is low and woody, and may be approached occasionally to 10 or 12 fathoms; but in the night large ships ought not to come under 20 fathoms, from 3 m. off shore. Venloos Inlet is rocky at the entrance, off which a ship may anchor in 12 fathoms, about 2 m. from the shore; but it is little frequented. When abreast of this place the Sugar Loaf, which is the nearest high hill, bears S.W. ½ W. About 5 leagues to the W. of the Sugar Loaf there is a hill called the Gunner's Quoin, 1320 ft. high, and two smaller ones nearer the sea to the W. by N. of Venloos, one called Baron's Cap; the other, nearest the coast, is called the Small Quoin. A shoal of 9 ft. bears N.E. 1¼ m. from Venloos Point.

The Coast from Venloos Bay to Foul Point, the S.E. extremity of Trincomalee Bay, is about N.N.W. ½ W., and the distance 12 or 12½ leagues. It is generally low and woody, with steep rocks fronting the sea; but in many places there is a white sandy beach. Ships passing between these places may sometimes meet with overfalls of 2 fathoms at a cast, the bottom being often rocky and uneven; in the night they may steer along in soundings from 18 to 23 fathoms, clear of all danger: with favourable weather, in daylight, the shore may be approached to 15 or 16 fathoms, and in some places to 10 or 12 fathoms. From 2½ to 7 leagues to the S. of Foul Point, a chain of rocky islets lines the shore, some of them more than a mile from it, on which the sea breaks very high in bad weather. The rocky islet called **Providien Island,** lies close to the shore, in lat. 8° 0½′ N., lon. 81° 33′ E. Alligator Rock is in lat. 8° 20½ N., being 3 ft. high and 1¾ m. off shore. The coast between them is rocky, and forms a bight; being dangerous, from the many rocks above and below water. In about lat. 8° 17′ N. is the S. or Virgel mouth of the Mahavilla Gunga River, the largest river of Ceylon, and off it there are some rocks about 3 ft. above water.

Navigation. Ships bound to the S. parts of the Coromandel coast, or to Trincomalee, should, in the S.W. monsoon, keep near the E. coast of Ceylon in passing from the land about Aganis to the latter place: the land-winds then blow very strong in the night, and frequently in the day, rendering it difficult for a dull-sailing ship to regain the coast if she unexpectedly get far to sea-ward, where the current generally sets to the E. in that season. Near the shore, along the N.E. coast of Ceylon, the current is fluctuating in the S.W. monsoon, generally weak, and sets mostly to the S.

TRINCOMALEE HARBOUR, with its **BAYS,** form a capacious inlet, the entrance to which, between Foul Point on the S.E. and Fort Frederick on the N.W., is 5½ m. wide, contracting, however, to about half that width between Norway Point to the S.E. and Chapel Island on the N.W., when it again suddenly opens, forming Great Bay to the S., and Trincomalie Harbour to the N. To the W. of these, separated from the Harbour by a peninsula, and connected by a narrow passage with the N.W. part of Great Bay, is Lake Tamblegam, which is navigable for boats only

The Harbour, taken in its fullest extent, is about 2 m. each way, indented by numerous bays and coves, and having in it several islands, and many shoals and rocks.

Foul Point, in lat. 8° 32′ N., lon. 81° 19′ E., about 14 m. to the N.W. by N. of Alligator Rock, is the Point that forms the S.E. side of Trincomalee Bay; it has a reef projecting nearly 1 m. to the N. of the Point.

Light. Foul Point has now a light-house, exhibiting at a height of 104 ft. above sea a light, *flashing* every 30 seconds, visible 16 m.; the faint light between the flashes is not visible beyond 10 m. There is another light now on Round Island in the bay, and the old light on Flag-staff Point by Fort Frederick has been discontinued.

When approaching the bay from the N., do not bring Foul Point Light to bear to the E. of S.S.E., to avoid the Diomede and other shoals. When approaching from the S., and Round Island *fixed* light is seen to the *right*, or N. of Foul Point, do not steer for the Harbour entrance till Round Island bears to the S. of W.S.W.

Flag-staff Point, in lat. 8° 35¾′ N., and lon. 81° 14′ E., the N. extreme of Fort Frederick, is high, steep-to sea-ward, covered with trees, and has on it several forts. This Point is the N. extremity of the narrow and crooked peninsula that forms the E. side of Trincomalee Harbour, and separates it from Back Bay. This peninsula being steep, bluff land, fronting the sea, is easily known, as the coast is low near the sea, both to the N. and S. The S.E. point of the peninsula, called Chapel Point, has an islet off it called Chapel Island, and to the N.E. a reef of rocks, distant more than ½ m., nearly on the edge of soundings, having 20 and 30 fathoms very close on the E. and S. sides; on the inner part of the reef, one of the rocks, **Chapel Rock,** is seen above water. Flag-staff Point is bold-to, and safe to approach; but, between it and Chapel Point, rocks stretch out from two small projections, nearly one-third of a mile, which ought not to be approached under 14 fathoms.

Elephant Point, the S.W. point of the peninsula, has an island, called Elephant Island, near it on the S.E. side, from which a reef, having 4 ft. water on its shoalest part, with a beacon buoy, projects to the W. Ostenberg Point, the W. point of the peninsula, is a little farther to the N.W., between which and Elephant Point there is a cove or safe harbour, with soundings from 5 to 14 fathoms. The entrance of Trincomalee Inner Harbour is ¼ m. wide, formed by Ostenberg Point to the N. and the Great and Little Sober Islands to the W.; Little Island being the E., and close to the other. About ½ m. S. from Great Sober Island, and 1 m. W. of Elephant Island, is **Clapenburg Island,** close to a point of the same name, forming the W. side of the harbour entrance; and about ½ m. farther to the S. is a point where the land is elevated a little, called Marble Point, with rocks projecting around. This point forms the W. extreme of the Great Bay, separating it from the entrance of the harbour, and affords a mark for going in. To the W. of Marble Point, between it and the entrance of Lake Tamblegam, there is an island called Bird Island; to the S.E. of it lies Pigeon Island, called also Elizabeth Island, distant 1 m., having 10 and 12 fathoms, water, close-to.

Round Island, 50 ft. high, stands nearly ¾ m. to E.N.E. of Marble Point, and about 1½ m. to the S. of Elephant Point. This Island (which now has a light-house) is very steep-to on its E. side, having 30 fathoms near it on the outside, then suddenly no ground. In 1859 H.M.S. *Niger* struck on a rock with 4 ft., surrounded by 5 and 3½ fathoms, bearing S.E. by E. ¼ E. 4 cables' length from Marble Point, and S.W. ¼ S. from Round Island about ½ m. On the S.W. side of this Island there is a rock above water; and another between it and Clapenburg Island, *but nearest the latter,* called Grummet Rock. The entrance leading to the harbour is formed by these islands and rocks to the S.W., and Elephant Island and Point to the N.E.

Light. Round Island, in lat. 8° 31′ N., lon. 81° 13′ E., now exhibits a *fixed* light, visible 10 m.

FOUL POINT, the outer S.E. point of Trincomalee Inlet, bears S.E. ½ E. 5½ m. from Flag-staff Point, and has a reef projecting from it to the N. nearly a mile, with 9 ft. on it. A light-house has now been erected here, exhibiting a *flashing* light, which can be seen 16 or 17 m. off, and is now the principal guide for this place. The coast to the W. is slightly concave to Norway Point, which bears from Foul Point about W.S.W. 2¾ m. Between these points, nearly a mile off shore, is *Northesk* Rock. **Great Bay,** forming the S. part of Trincomalie Inlet, is upwards of 5 m. across in its widest part, but not more than 3¾ m. between Norway Point on the E. and Marble Point on the W. These are its entrance-points, and lie nearly E. and W. of each other. The centre of Great Bay is very deep, having no bottom at 80 fathoms; soundings, however, are soon obtained on approaching the shore, and varying from 40 to 7 or 8 fathoms. Four rivers, navigable by small boats, fall into the S. part of the Bay, nearly at equal distances from each other. The mouth of the Mahavilla Gunga is 3 m. to S. of Round Island, and the mouth of Lake Tamblegam lies 3 m. to

the N.W. of this river. The bank of soundings, lining the shores of the Bay, extends very little outside the islets or rocks, except at the S.E. part, between the Rivers Cotiar and Sambor, where ships may anchor in 10 or 12 fathoms regular soundings, soft mud, sheltered from E. and S. winds. The E. side of the Bay is bounded by Norway Point to the N., which is W.S.W. of Foul Point: Norway Island lies on the W. side of the Point, having a rocky reef encompassing it, and the islets near it. From this Point and the island a sand-bank stretches more than 1¼ m. to the S., with soundings on it 2 to 4 fathoms, and 20 or 25 fathoms close-to: to the W. of it, ¼ m. distant, there is no ground; but to the S., between it and the River Sambor, there is good anchorage near the shore. Norway Point and Foul Point must be avoided, on account of the reefs projecting from them about ¾ m.: nor should the shore between them be approached, the soundings being irregular, and about half-way there is a very dangerous rock, distant from the shore about a mile, called *Northesk* Rock, from a ship of that name being lost there—it has 9 ft. on it. Close to it, on the outside, are 12 and 14 fathoms, and 7 or 6 fathoms inside. When on it, Flag-staff Point bears N.W. by N., Norway Island S.W., and a hill in the country touching Marble Point W. by S., and Foul Point E. ½ N.

In making the Port of Trincomalee during the months of Oct. and Nov., there is some difficulty from the strong current which sets to the S. at the rate of 2½ or 3 knots; and from the light variable winds, with occasional squalls, and thick weather, which prevail until the N.E. monsoon sets in, about the end of the latter month. Several cases have occurred of vessels of war being swept to the S. during that period, and of not being able to regain their ground for several days. H.M.S. *Melville* was ten days trying to sight the port before she succeeded. Ships, therefore, bound there in Oct. and Nov., or indeed from end of Sept. to the end of March, should endeavour to make the land in about 9° 0′ N., which is 15 m. to the S.S.E. of Molativa Shoal. The coast is there clear, and may be safely approached to 20 fathoms, even by night. If the land be made toward the close of the day, the ship's head should be put to N.N.E. or N.E., and a rate of 3 or 4 knots preserved during the night. Should the wind be N.E., it would be advisable to keep working to windward, and when standing to the N.W. the lead should be kept *constantly* going, and the ship tacked to the E. as soon as the water is shoaled to 22 or 20 fathoms. At daylight run in for the land on a N.W. or W.N.W. course. Should it be made to the N. of Pigeon Island, a course should be steered to keep outside that island, and not to haul in till the ship has run 3 or 4 m. to the S. of it. She may then steer direct to the Flag-staff Point of Trincomalee. The nearer the point is approached, the more will the influence of the current be avoided: and though the sea-breeze may be very weak, yet a vessel will seldom fail to reach the port. The position of Pigeon Island, and its adjacent rocks and shoals, render the approach to the shore at night, during the above-mentioned period, a task of much anxiety; and as a vessel will naturally close the land as much as safety will permit, great care should be taken in allowing for the constant set of the current to the S.S.E. of at least 2½ knots.

From March to Sept. there is no difficulty in making Trincomalee; the current in the offing sets to the N. but frequently to the S., though it seldom runs more than 1 knot near the shore. Between the lat. of 7° 0′ and 9° 30′ N., the shore may be safely approached to 22 fathoms at night, and to 15 fathoms in the day.

To sail into the Harbour, with a fair or leading wind, a ship may enter the bay, keeping nearly equal distance from each side; when Round Island and Marble Point are discerned, the Point ought to be kept about W. by S. ½ S., open to the N. of that island until the harbour's mouth is open. No soundings will be obtained in the middle of the bay. When Round Island or Elephant Island is approached, she ought to steer in about mid-way between them, and will then have soundings; after hauling to the N.W. for the harbour, care must be taken to give a berth to the reef, stretching from Elephant Island, by not coming under 10 or 12 fathoms towards it. When a ship going into harbour first opens the channel between Elephant Island and the main, she is nearly abreast of that reef; when wide open she is past it. On the hill of Ostenberg Point, there is a battery built with brick on the E. part of the fortification, higher than any battery there, and easily distinguished. The flank of this battery kept on with Elephant Point would carry a ship close to the shoalest part of the reef, where there is only 4 ft.; but the battery kept open with the point, which is the best mark, will carry her clear of it, in not less than 10 fathoms. There are 24 and 30 fathoms between the points that form the entrance of the harbour; and after passing the reef contiguous to Elephant Island, a ship should steer direct for the harbour on about a N.N.W. course. Although narrow, either of the points may be approached within a ship's length; and when through this narrow part, a spacious harbour appears, where a great navy may anchor in good ground, sheltered from all winds, with several coves convenient for careening ships. When within the entrance, it is prudent to steer to the N.N.W. to avoid the shoal within Ostenberg

Point, and York Shoal farther to the N. The former has only 11 ft. water on it; with York Island and Flag-staff Point in one, and Pigeon Island and the low part of Ostenberg Point in one, a ship will be in 5 or 6 fathoms on it, and close to the shoalest part. It is small, with deep water all round; between it and the shore, near Ostenberg Point, there are 7 and 8 fathoms.

York Shoal has only 5 ft. water on its shoalest part, marked by a beacon buoy. To avoid it, a ship in steering up the harbour must keep Round Island a little open with Ostenberg Point; but there seems no good land-mark to point out when a ship is to the N. of it, that she may haul to the N.E. for the merchant-ship anchorage abreast the town. When the *Intrepid's* boat was at anchor on its outer edge in 3¼ fathoms, within a ship's length of its shoalest part, Round Island bore S. ¾ E., seen over the low part of Ostenberg Point, the centre of York Island N.E. by E. ¼ E., and the N.W. point of Great Sober Island nearly W. by S. ½ S. The shoal is not more than half a cable's length from N. to S.; and it is steep all round. Ships may moor abreast the town, to the N.W. of York Island, also to the N. of Great Sober Island, or in any other part of the harbour, clear of the shoals.

In the S.W. arm of the harbour, between Great Sober Island and the point to the N.W. of it called Round Point, there is a rock nearly mid-way, called the **Sister Shoal,** not more than 3 fathoms in diameter, with 9 ft. water on it, and from 7 to 9 fathoms all around. It is not in the way of ships unless they anchor in that part of the harbour to cut wood in the S.W. monsoon. Round Point bears from this rock N. by E. ¼ E., and the N.W. point of Great Sober Island S. ½ E. When on it, the middle one of three windows, in a long white barrack on Ostenberg Point, is on with the E. point in sight of Great Sober Island, and a point of land near Clapenburg Cove open about a boat's length with the N.W. point of Great Sober Island.

Clapenburg Point, the E. extreme of Clapenburg Island, lies nearly 1½ m. to N.W. by N. of Round Island. Grummet Rock is to the S. of Clapenburg Island. About 2 cables' lengths to the N.N.E. ½ E. of the Grummet Rock, between it and the outer point of Clapenburg Island, lies the outer part of a ledge, called the Minden Rocks, with only 10 ft. water on it, and 10 fathoms close on the outside; and it may be observed, that all the shoals in the bay, or in the harbour, are generally steep-to.

The Master Attendant recommends ships not to attempt the inner harbour during the night, except under the most favourable circumstances, and having a person on board possessing a local knowledge of the harbour and its entrance.

Working into the Bay with an adverse wind, observe, that when the wind blows strong from W., there is a strong outset from the S. part of the bay, rendering it difficult to work in at times during the S.W. monsoon; ships then bound to Trincomalie generally fall in with the land to the S. of the bay. The reef projecting from Foul Point, about ¾ m. to the N.N.W., is not very dangerous, as the depths decrease regularly to 4 and 5 fathoms close to its N.E. verge, and from thence the bank of sounds extends about 2 m. to the N., where 36 and 40 fathoms are got on its N. extremity, with Flag-staff Point bearing W. by N., and Foul Point S. ¾ E., the next cast no ground. In passing Foul Point, you may borrow into 14 fathoms; when about a mile to the N. of it, or when Marble Point opens to the N. of Round Island, or with Round Island Light bearing W.S.W., then haul up for Flag-staff Point if the wind permit. For a considerable space between these points, no soundings are obtained in crossing.

To avoid the outset from the bay, work in abreast of Back Bay and Flag-staff Point, which point is safe to approach, close to it the depths being 15 and 16 fathoms. When in with this land, take care, in rounding Chapel Point, on your S. course, to give a berth to the reef stretching from it about ½ m. to the E., having from 30 to 50 fathoms close to it on the S.E. side, and no soundings about ¼ m. from it. In coming from the N. towards it, borrow not under 18 or 20 fathoms; but the mark to clear it is a white rock, like the wall of a house, on the inside of the N. point of Back Bay, called Elizabeth Point, kept about a sail's breadth open with Flag-staff Point, till Elephant Island is all seen to the *left* or S. of Chapel Island. When round Chapel Rock, you may borrow on Chapel Island and the N. shore until past Elephant Island, which are all steep-to, without soundings until very close to the shore, and no danger but what is visible. In standing to the S. towards Great Bay do not borrow under 20 fathoms towards Northesk Rock, Norway Island, nor any part of the coast between it and Foul Point, where the bottom is rocky with irregular soundings, and Norway Island is surrounded by dangers. It is not advisable to stand farther to the S. than to bring Round Island on with, or just touching Marble Point, until well to the W. of Norway Island; and this mark will carry you clear of all dangers on that shore.

Being to the W. of Norway Island, do not stand too soon to the S., towards the bottom of the bay, on account of the sand-bank, with 3 fathoms on it, extending about a mile to the S.S.W. of

that island, having 15 and 16 fathoms water within half a ship's length of it, and at a small distance no soundings. To pass clear to the W. of this danger, a great tree on the middle of the land forming Flag-staff Point should be kept on with, or just touching Chapel Point, until the small island at the entrance of the lake is open to the S. of Pigeon Island: you will then be clear to the S. of all the dangers of Norway Point. If in standing to the S. the tree open with Chapel Point, tack to the N., to keep it on, or shut in with the Point, until past these dangers.

In approaching the bottom of the bay, the lead must be kept going; for although there are no soundings within a mile of the shore in some places, the first cast may be 35 or 40 fathoms, then 18 or 20, and the next cast probably 10 or 12 fathoms. It would be imprudent to go under 12 or 14 fathoms, as the distance from these depths is not more than 1 or 2 cables' lengths in some places to 4 fathoms, at the distance of ¼ or ½ m. off the shore; but to the S. of the bank stretching from Norway Point, in the S.E. corner of the bay, the soundings are more regular, and extend farther out, where ships may anchor, as already observed. In standing to the N. for the entrance of the harbour, you may pass close to Round Island, it being steep-to; from thence you will probably reach the harbour's mouth without tacking, and ought to keep close to the weather-shore in entering it. After being within, anchor on the E. or N. side of Great Sober Island, or where it may be most convenient.

The Back Bay of Trincomalee, on the N. side of the Peninsula, which separates it from Trincomalee Harbour, is about 3 m. wide and 1 m. in depth, bounded by Fort Frederick Flag-staff Point to the S., and Elizabeth Point to the N. The common anchorage is in the S. part of the bay, in from 7 to 10 fathoms sandy bottom, with Flag-staff Point bearing from S. by E. to S.E. by S., distant 1 or 1¼ m. The soundings decrease gradually to the sandy beach, except about a mile to the N.W. of the point, where rocks project from the shore to 4 fathoms. Ships may lie securely in this anchorage during the S.W. monsoon, and procure supplies of wood and water. Buffalo beef may be got, but vegetables and other refreshments are scarce. Ships of war sometimes go into the harbour to careen, or to escape the bad weather often experienced on the N.E. coast of Ceylon, and on the Coromandel coast at the early part of the N.E. monsoon; but there being little trade carried on at Trincomalee, it is seldom frequented by merchant ships. Apart from the difficulty of procuring vegetables and other articles of refreshment at Trincomalee, it is generally considered an unhealthy place, being surrounded by low, marshy land. The land-winds are very noxious to Europeans who sleep on shore, exposed to them in the night: many seamen of H. M.'s fleet, under the command of Admiral Hughes, by exposure to these winds, were seized with spasms, which generally ended in speedy death.

To anchor in Back Bay (which ships may safely do between mid-March and mid-Oct.) having brought the Flag-staff Point W.N.W., ships may steer directly for it, rounding it close, and anchoring in 10 fathoms, with it bearing S. by E. Small vessels may anchor in 6 or 7 fathoms, with the point bearing S.E. by E. Ships coming from the N., and wishing to anchor in Back Bay, should not bring Flag-staff Point to bear to the W. of S.; that bearing will lead 2 m. E. of Pigeon Island, and nearly a mile E. of the Lively Rocks. When quite sure of being to the S. of these rocks, ships may bring the Flag-staff S. by E., and anchor as before directed. From Sept. to March, a ship bound into this port should take care not to fall in with the land to the S. of Flag-staff Point, as the currents often run strong to the S. on the E. coast of Ceylon during the N.E. monsoon. On the same coast they are liable to fluctuate in the S.W. monsoon, though it is then prudent to fall in with the land, rather to the S. than to the N. of the port.

Elizabeth Point, which is over 3 m. to N. by W. of Fort Frederick, is the N. extreme of Back Bay. South by E. from Elizabeth Point rather more than 2 m. are several rocks under water projecting from the shore, having 5 and 6 fathoms close to them. Directly to the E. and S.E. of the same point, distant ½ m. to 1 m., two rocks are seen, about the size of a boat, with others under water, projecting from them about ½ m. to sea-ward: these are called the *Lively* and *Heroine* Rocks, having foul ground 7 and 8 fathoms very close to them, and should not be approached nearer than 12 fathoms on the E. side.

A ship abreast of Elizabeth Point and the Lively Rocks, ought not in coasting to the N. to come under 18 fathoms, on account of several sunken rocks between that point and Pigeon Island, which are dangerous to ships making too free with the shore. Two of these rocks bear about N. ¾ W. from the Flag-staff Point, and S.S.E. ½ E. from Pigeon Island, nearly mid-way between these places, distant about 2 m. from the shore, and lie near each other. The ship *Fairlie* and H. M. S. *Diomede* struck on these rocks.

Navigation. A ship leaving Trincomalee, or being abreast of Flag-staff Point in the S.W. monsoon, and bound to the S. part of the Coromandel coast, should keep near the N.E. coast of Ceylon, as the wind frequently hangs far to the W., and blows fresh over the low N. part of the

island. A course *about* N. by W., if near Flag-staff Point, will be proper, until clear to the N. of Pigeon Island, taking care not to borrow under 22 or 24 fathoms in the night, nor under 20 fathoms in the day, toward that island, or toward the Diomede and Fairlie Rocks.

Winds and Currents. During the N.E. monsoon, the current frequently sets to the S.W. into Palk Bay, between Point Calymere and Ceylon; ships, therefore, which are bound from the S. part of the Coromandel coast to Trincomalee in this season, should be cautious to keep well to the E. in crossing, to prevent being drifted near the shoals off the N. end of Ceylon. Gales of wind blowing directly upon the shore, are liable to happen in Nov., Dec., or Jan., sometimes making a close approach to the N.E. side of the island dangerous. Several vessels have been driven on shore and wrecked by these gales; but they are not frequent. His Majesty's ship *Sheerness*, and two other ships in Trincomalie Inner Harbour, were driven on shore and wrecked in one of these severe storms. It commenced at sunset, 7th Jan., in a dreadful hurricane at N.W., with heavy rain, and shifted suddenly to N.E , when they parted all their cables and drove on shore.

In Oct. and Nov. the weather is often unsettled, with squalls, rain, light baffling winds, and frequent calms along the N.E. and E. coast of Ceylon, with strong currents running to the S. Ships bound to Trincomalie in these months, or at any time in the N.E. monsoon, should endeavour to get into soundings to the N. of that port, to prevent being carried past it by the currents. In Oct. and Nov. a strong current may always be expected to set along the E. side of the island to the S., when the wind is from the N., or when it is light and variable. Off the Great Bassas it then sets to the S., at times 1½ and 2 m. an hour; at times it is stronger, and follows the direction of the land to the W. as far as Point de Galle, or even to Colombo: this has also been experienced in March, when the winds were faint and variable. When the wind blows strong along the shore on either coast, the current is generally governed by it, and runs strong to the E. along the S. side of the island with the steady winds which prevail in the S.W. monsoon. But in this season, on the E. coast, the winds, although variable, are generally from the land, and a drain of current* often sets to the S. between the Friar's Hood and the Bassas. The high land is often enveloped in clouds, from the great quantity of vapour with which this island is generally covered; and when these clouds are unusually dense, severe squalls blow at times from the land, which require caution, as they give very little warning. These squalls are liable to happen at the changing of the monsoons, or during the strength of the S.W. monsoon.

In the latter end of Feb., or in March, when the force of the N.E. monsoon is abated, there is at times little S. current running along the E. coast of Ceylon; in March it sometimes sets weakly to the N., with a kind of night-and-day winds, similar to land and sea-breezes; ships, should, therefore, after reaching the Bassas in this month, continue to work round the E. side of the island, if the winds are moderate, and the current not strong against them. When they reach the E. part of the coast about Aganis, the winds and currents may be expected to be more favourable for getting to the N. than they are at the S.E part of the coast about the Bassas. On the S. part of the Coromandel coast, a favourable current setting along shore to the N. is almost certain in part of Feb. and March, with light variable breezes for proceeding up the bay. If N.E. winds be encountered off the S.E. part of Ceylon, a ship may stand to the E. into the open sea, where the wind will most probably become variable to N.W. and W.

PIGEON ISLAND, in lat. 8° 43′ N., lon. 81° 12′ E., bearing *about* N. by W. ¾ W. from Trincomalee Flag-staff Point, distant 8 m., is a rocky island, with a peak about 100 ft. high, with some shrubs on it, encompassed by islets and rocks above and under water, with others between it and the shore, where there is no safe passage except for boats. Although it may be approached to 18 fathoms on the outside, it is advisable to pass at the distance of 1½ or 2 m. from it, in soundings from 21 to 24 fathoms. The bank of soundings between Flag-staff Point and Pigeon Island seldom exceeds 3 or 4 m. distance from the shore, and from the depth of 40 to 42 fathoms it has a steep declivity in most places to no ground. On the N. side of Back Bay, a little inland, there is a hill of a conical form, and another hill to the W. by N. of Pigeon Island, called Mount Erasmus, having on it a tower or pagoda, 310 ft. high; but the land facing the sea is low.

Molewal, or Molateeva House, in lat. 9° 16¼′ N., lon 80° 49′ E., stands close to the sea, and bears about N.W. by N. from Pigeon Island, distant 13 ½ leagues; the coast between them is low, and safe to approach to 18 or 20 fathoms in the night, if the lead is kept going, or to 12 fathoms occasionally, when working in daylight. About 3½ leagues from Pigeon Island there is Red Cross River, and 3 leagues farther to the N.W. is the River Cocklay. From Molewal House, a dangerous coral shoal, having only 6 to 12 ft. water on it, called **Molewal Shoal,** extends to the E. and N.E.

* It has been said of late years that the late Captain Horsburgh did not notice the fact of a S. current along the E. coast of Ceylon during the S.W. monsoon, but the above remark is taken from an edition of this Directory, published in his life time.

near 4 m. from the shore, which ought not to be approached nearer than 13 fathoms. As there are 20 and 21 fathoms, water, about 6 m. from the shore, and 4 or 5 m. to the S.E. of the shoal, a ship should edge out a little when near it; but when abreast of its E. extremity, she may with the land-wind borrow towards it to 13 or 14 fathoms. The N. side of this shoal is not so steep, but is composed of detached knolls, the depths decreasing regularly to 9 or 10 fathoms close to its N. verge, and to 6 and 7 fathoms along the N.W. part close to the shore. From this shoal the coast is low to the N.E. point of Ceylon, with 7 fathoms, water, near the sandy beach; but care is requisite to avoid the following danger.

POINT PEDRO SHOAL encompasses the N.E. extremity of the island, and from thence stretches nearly parallel to the coast about 8 leagues to the S.E, having only 2¼ to 4 fathoms on it in many places, and 2¼ fathoms on two patches, in lat. 9° 50½′ N.: one of these bears nearly E. ¾ S. from Point Palmyra, the N.E. extreme of Ceylon, distant about 5 m.; the other, N. ¼ E. from the same point, distant 4 m. Between this extensive narrow shoal and the coast there is a safe channel (the *proper* Palk Strait), about 2½ to 3 m. wide, with regular soundings, soft mud, 7 fathoms close to the shore, 7, 8, or 9 fathoms in mid-channel, and 5 or 6 fathoms close to the inner edge of the shoal. To the E. of it the bank of soundings is also flat, with regular depths, decreasing to 5 and 6 fathoms close to the S.E. and E. parts of the shoal, and to 4 fathoms, coarse brown sand, close to its N.E. verge. To clear the S. part of the shoal, Paspy or Mark House in lat. 9° 32¾′ N., must bear about W.S.W.

The late Captain P. Heywood worked round the S. end of Point Pedro Shoal in H. M. ship *Leopard*, and passed between it and the coast, through the Inner Channel, to Point Pedro village; here he remained some time, and with the assistance of the *Providence* schooner, completed a survey of the shoal and the bank of soundings contiguous to the N. end of Ceylon; which survey had previously been begun and carried on from Molewal Shoal by Mr. Duncan Weir, master of H. M. ship *Suffolk*. The lapse of more than half a century must have made great differences in these shoals, and the Middle Banks of Palk Strait.

To pass inside of Point Pedro Shoal, Captain P. Heywood gave the following instructions:— Ships coming from the S., after passing Molewal Shoal in 12 or 13 fathoms, ought to observe that the coast from thence takes a direction about N.W. by W.; but it is not advisable to haul in for the land nearer than 9 fathoms until in lat. 9° 34′ N., between which and the S. tail of Point Pedro Shoal there are good soundings from 9 to 6 fathoms, the nearer the shore the more regular. Should the wind hang at N.W., making it necessary to beat, come no nearer the tail or inner edge of Pedro Shoal than 6 fathoms; but to the shore you may borrow by distance, as it is steep-to all along, with 7 fathoms at the distance of 1 or 2 cables' lengths. If the wind is free when in lat. 9° 33′ N., steer in W., to get sight of the Mark House, which bears S.W. ½ W. from the S. point of Pedro Shoal, and when seen is an excellent mark for entering the channel; but is with difficulty discerned till very near. With this W. course you will carry generally more, but never less, than 6 fathoms close in to the shore, along which you may steer at any convenient distance, as the wind may be, until you raise **Palmyra Point**, in lat. 9° 51′ N., lon. 80° 12′ E., which is the N.E. point of Ceylon, remarkable by high palmyra trees growing on it, rendering it conspicuous when seen either from the S.E. or N.W. From this point, a small breaking reef projects about ¼ m.; the *Leopard* rounded it in 7 fathoms at the distance of ¼ m., and anchored in that depth, with the village of Point Pedro bearing about S.S.W., and Palmyra Point S.E. ½ S. The village is between these points, which bear about E. and W. from each other nearly 3 m., Point Pedro being the N.-most part of the island; from hence, the coast extends to the N.W. point of the island W. ½ S. 15 or 16 m. This N. coast of Ceylon is steep-to, with 6 or 7 fathoms, water, close to the shore, between which and the banks there is a fine channel, from 3 or 4 to 9 m. wide, with regular soundings from 7 or 8 to 5 fathoms, over a bottom of blue mud.

Navigation. Ships bound from the E. coast of Ceylon to the Coromandel Coast, after passing Molewal Shoal, may steer along the bank of soundings, taking care not to come under 9 or 10 fathoms in the night, until in lat. 10° 0′ N.; being then clear to the N. of Point Pedro Shoal, they may borrow into 8 or 9 fathoms occasionally, in crossing over to Point Calimere, which bears from Point Palmyra *about* N.W. ½ N., distant 13 leagues. From 10 to 20, or 25 fathoms, are good depths to preserve, in passing from Molewal Point to Calymere in the S.W. monsoon; the depth will decrease considerably abreast of Point Pedro Shoal, and to the N. of it, in steering a direct course between them; but there is no danger if a ship do not come under 9 or 10 fathoms. If a ship borrow under 15 fathoms, attention to the lead will be requisite in crossing, as the current sometimes sets to the W. in the S.W. monsoon, into Palk Bay. When a ship is bound to Madras, or farther to the N., she need not be particular in borrowing so close to Points Palmyra and Calimere, but it is prudent to keep in soundings, and she ought to be certain to make the coast of

Coromandel well to the S. of her port of destination, for the current frequently sets very strong to N. along that coast in the S.W. monsoon. The current during the S.W. monsoon sometimes sets into the bay between the continent and the N. part of Ceylon, but more frequently in the opposite direction, to the E., rendering it proper to keep within a moderate distance of the land; for a dull-sailing ship happening to round the E. side of Ceylon at a great distance in the strength of the S.W. monsoon would probably not be able to make the coast until to the N. of Madras, which has often been experienced.

PALK BAY, between the continent and the N. part of Ceylon, and named after Governor Palk by the Dutch, is bounded by Adam's Bridge and its contiguous islands to the S., by Calimere Point and the coast of Tanjore to the N. and W., and by the N. part of Ceylon with its islands to the E. The Dutch described *three* channels formed between Calymere Point and the N. end of Ceylon, which lead into Palk Bay: but the S. channel, called **Palk Strait,** contiguous to the N. coast of Ceylon, is probably the only one that may be considered safe for large ships, and even this is only imperfectly known, as the banks are liable to shift, and the W. part of the channel has not been all surveyed.

There are two entrances into Palk Bay from the E.; one between Point Calimere and the N. end of the Middle Banks, having 19 to 24 ft.; the other between the S. end of the same banks and the N. coast of Ceylon, with 5½ to 6 fathoms. All commanders, with a vessel drawing 12 ft., are advised to make use of that to the S., the *proper* Palk Strait, except with a leading wind, or with the aid of steam.

The N. Channel. Paumben Pass bears from Point Calimere about S.W. by S. 73 m. After rounding the spit that stretches off to rather more than a mile E. of the latter place in about 3½ fathoms, 3 m. off shore, small vessels may stand S.W. ½ S., keeping in 3½ to 4 fathoms till two large detached Palmyra-trees to the W. bear about N. She is then clear of the banks. This channel, through the centre of which the above directions lead, is 3 m. wide, having a small sandy knoll, with only 2¼ fathoms on it, about a mile inside its S. boundary, and 4 m. S.S.E. of the point. The depths on each side vary from 2 to 3 fathoms, with a bottom of hard sand, while that of the channel itself is mostly mud.

The Middle Banks from the above channel stretch in a S. direction to within 8 m. of the Ceylon coast, having an average breadth of 3 m., with uneven soundings of 2 to 3½ fathoms, and in one place only 9 ft. This spot is situated 8½ m. nearly S.S.E. from Point Calimere, and 9½ m. S.E. from the two remarkable trees already noticed. It is composed of hard fine sand, and should be carefully avoided. There is always what is called a *swash* over these banks, which renders it hazardous to be on them in an open boat during a breeze.

In the N.E. monsoon a vessel bound against it should work up on the Ceylon side as far as Kayts, when she may stand over to the coast of India, and creep to windward in smooth water. With the strong currents ever attendant on the monsoons in the middle of the Bay, it is impossible to contend against them without thus taking advantage of smooth water and weather-shores.

The S. Channel. In beating into the Bay against the S.W. monsoon, a vessel should stand over to the N. coast of Ceylon, and work down to the island of Delft (Nedaenteevo), whence a stretch may be made across the Bay to its W. side, where land and sea-breezes will be met with, accompanied by smooth water. The well-known Pedro Shoal extends from 20 m. S.E. of Point Pedro to about 6 or 7 m. N.W. of it, and even joins to the Middle Banks; but this N. part of it has not been thoroughly examined, though known to have patches with 4 fathoms in some places. There is a good channel of 2½ to 3 m., with 7, 8, and 9 fathoms, mud, between it and the shore. The most dangerous part on its N. end bears from the point about E. to E.S.E. 4 m. off shore. It has in some parts as little as 2¼ fathoms, and a vessel in passing it ought not to shoal her water on the bank to less than 6 fathoms, when she will be about 3 m. off shore, with deep water inside. Inside this, a vessel working to the W. may approach the shore with safety to within ½ m., carrying from 6 to 8 fathoms, sand and mud, till abreast of Kangeserong, which may be known from its two bungalows, each built on a rocky platform washed by the sea. To avoid some foul ground, which reaches from the beach at this place to a distance of 2 m. from shore, a little further W., she must now be careful not to shoal her water to less than 6 fathoms on her in-shore tack, or to less than 5 on her N. or off-shore board, as the S. end of the Middle Banks, with 2¾ and 3 fathoms over it, lies to the N. The channel is 6 m. broad from the foul ground to the end of the banks, with 5½ to 8 fathoms, sand and mud in it; when the opening between Karateevo (Amsterdam Island) and the main bears due S., the foul ground is passed, but then there is shoal water (with patches of 3½ and 4½ fathoms) extending as far as has been surveyed to the N.W. of Karateevo Great caution is necessary in a large ship when passing over this space, and the lead must be kept

going. A vessel can then shape a course to any part of the bay, having good anchorage in 4 to 5 fathoms ½ to ¾ m. outside any of the islands. Following these directions, a vessel from Point Pedro ought not to shoal her water to less than 4 fathoms, but more generally have a depth from 5 to 6 fathoms.

If bound to Jaffna, she should, after passing Kayts, stand to the S., rounding Elwateevo, Anellateevoo, and Namateevo, at a distance of 1 to 2 m., till within 2 or 3 m. of Nedaenteevo (Delft), which she will make ahead. She may then steer more to E., keeping about a mile from Tomgrateevo, and taking care not to haul to the N. of E. till that island has been left 4 or 5 m. behind, or till Calmaene Point bears about N.E. by E. A small vessel, having Calmaene Point E. by N. to N.E., may steer for it till she opens Jaffna Fort Church clear of the island of Nandeteevo, when she can stand freely for the opening, carrying from 4 to 2½ fathoms over a rocky ledge, to 2¾ and 3 fathoms inside on sand, and anchor with the following bearings:—Calmaene Point E., Fort Church about N. by W.; but care must be taken not to approach Calmaene Point within 600 or 700 yards, as there are some rocky heads some distance from it.

The anchorage for a large vessel is outside the rocky ledge, with the Fort Church bearing N. by E. over the centre of a small island called Small Pox Island, just clear of the small Cocoanut Tope on Mandeteevo and Calmaene Point N.E. by E.; she would then be in 4½ fathoms, sand, about 2 m. off the islands. It must be borne in mind, however, that this anchorage ought not to be used from the middle of May to the middle of Aug., when the S.W. monsoon, from which there is no shelter, blows with great violence.

A rock was supposed to exist in the approach to Jafnapatam from the W.; but after a careful examination, no such danger could be discovered; and although some pilots declare that it is still there, they are unable to point out the precise spot. This, added to the testimony of some divers, who declare that they never met with it, although employed in the neighbourhood from childhood, may lead us safely to infer that the pilots are in error, and that no impediment is offered to the safe navigation of this part of the coast.

If bound to Kayts. No vessel, drawing more than 8 ft., should attempt to enter the harbour; for although there are 7½ ft. in the channel at L. W. springs, the greatest rise is not more than 15 in. To avoid the foul ground extending 1½ m. to the W. of the N.W. end of Karateevo, a vessel ought to keep in 5 fathoms till Elwateevo bears S. by W.; she may then stand for that island, shoaling her water to 3 fathoms till Fort Hamenhiel (built on a rock, at the N. side of the entrance), bears S.E. by S., when she can steer for it, keeping the Custom-house Point, on which is a large clumpy tree, over the low sandy point of Karateevo, till within ¼ m. She will now be in 9 ft. smooth water, and keeping more to the S., may round the fort at the distance from 200 to 700 yards, according to circumstances, care being taken when inside to borrow over on the N. side of the harbour till past an old bungalow on that side. Any anchorage may then be selected, but the best is off the Custom-house, in 11 or 12 ft., mud. Outside good anchorage is obtained in either monsoon, in 13 or 14 ft. smooth water, with the fort bearing S.E. 1½ m., the N. end of Elwateevo S.W. ¼ m., and the N.W. end of Amsterdam Island N.E. In the S.W. monsoon the bank of Elwateevo may be approached a little closer, and in the N.E. monsoon, she may go nearer the foul ground off Amsterdam, which will give a vessel more room for weighing. Large vessels should, of course, anchor farther out.

MADRAS, OR COROMANDEL COAST.

We commence a description of this coast with the Paumben Pass and the Indian shore from that place to Point Calimere. The **Madura coast** extends from Tonitory to Kottipatnam, in lat. 9° 58′ N., and lon. 79° 15′ E., just to the N. of which a narrow sand-bank projects off shore 13 m. to the E., which may be said to mark the boundary between the Madura and Tanjore districts. The **Tanjore coast** extends from Kottipatnam round Point Calimere and beyond Negapatam.

The Paumben Pass N. entrance lies nearly 6 m. to the W. of the Great Ramiseram Temple, and about 1 m. to the W. of Paumben light-house. Some account of it has been given in the preceding chapter, which describes the Gulf of Manar. Vessels drawing more than 12 ft. cannot pass through yet, but the approach on the N. side is clear of all obstructions to navigation. **Paumben Light,** in lat. 9° 17′ N., lon. 79° 12′ E., is *fixed*, 97 ft. above sea, and visible 12 m. off. Its column is circular, and about 50 ft. high. The light may be steered for on any bearing between S.W. and S.E., but the Pass must only be entered by daylight, and a Government pilot must be taken.

Tonitory or Tonitorai Point, about 2 m. to the W. of Paumben Light, is the E. extreme of the **Ramnad promontory** (the E. portion of Madura), the coast of which hence trends to W. by N. and W.N.W., for some 12 m., to the mouth of Vigay river and Autankurry town; and thence

round N.W. to Devipatnam, whence the Madura coast takes a general direction of N.N.E. to Kottipatnam, beyond which the Tanjore coast curves round by the N. and E. to Calimere. The principal towns on this coast are Devipatnam, Tondy, Minbesel, and Kottipatnam, in the province of Madura; and Adrampatam, in Tanjore, in lat. 10° 20′ N., and lon. 79° 20′ E., from which town to Point Calimere (a distance of 28 m.) there is only one small fishing village, that part of the coast being very low, and intersected by numerous small creeks and rivulets, which overflow the country for a considerable distance from the sea. The entrance of Muttupettai, the largest of these rivulets, is 19 m. W. of Point Calimere, and off it there is a mud flat, on which was found only 3 ft. water at low tides. This and the other creeks communicate with an extensive back-water, which is only navigable by the smallest description of trading boats. From the town of Adrampatam to Tonitory the whole coast is thickly populated, principally by Hindoos and a few Mahomedan traders.

The coast is low and sandy, some parts are well cultivated with grain, and in the vicinity of towns and villages there are extensive groves of cocoa-nut trees, but the principal produce is salt, which is procured from salt pans on the banks of creeks that intersect the whole coast. In all the towns and many villages there are remains of large temples and some fine choultries; the latter are still kept in tolerable repair for travellers. At the village of Shalavanaikapatnam there is a splendid column erected in the middle of a small fort, both of which were built by the Rajah of Tanjore, in 1814, to commemorate the victories gained by British troops over those of France.

The soundings along this coast are regular, there being 4½ and 5 fathoms at the distance of 6 m. off shore, from thence it shoals gradually to the beach. There is a narrow sand bank, extending 13 m. off shore, from a low point, in lat. 10° 2′ N., lon. 79° 19′ E., on which there is only 1 and 2 fathoms water. In passing this part of the coast a vessel ought to be kept out in 6 fathoms, which would take her clear of the bank. There is a small rocky patch, with only 2 fathoms on it, due S. of the bungalows on Point Calimere; by keeping in a line of soundings of 3¼ to 4 fathoms, about 3 m. off shore, a vessel would pass outside of these rocks and foul ground off the point, and inside the N.E. boundary of the outer reefs; the channel between these dangers is 1¾ m. wide, with from 3 to 4½ fathoms water in it. Off the extreme point of Calimere there is a sand-bank that extends 1 m. off shore, on which the sea beats very heavily; this bank affords tolerably good shelter to the trading boats in blowing weather.

Winds and Weather. In the Gulf of Manaar and Palk Bay the S.W. winds generally commence about mid-April, with fine clear weather; and early in May the monsoon blows fresh, and continues until mid-Aug., when it moderates, and gradually dies away about the end of Sept.; the sky then begins to be overcast with dark clouds, and about the 10th of Oct. the N.E. monsoon commences, with hard squalls from all quarters, accompanied by heavy rain, thunder, and lightning; this weather continues during the month, the wind then becomes steady from N.E., but during the months of Nov., Dec., and Jan., there are frequent gales and much rain. In the early part of Feb. the N.E. winds take off, and regular sea and land-breezes set in, which continue until mid-March, when calms prevail for several days, and the weather becomes very warm, until the return of the S.W. winds in April.

Navigation. A ship being in 18 or 20 fathoms water, abreast of Point Pedro Shoal, and bound to Negapatam in the S.W. monsoon, should steer N.W. by N. 8 or 10 leagues, taking care to keep in soundings; if the water deepen after having run a few leagues to the N. of the head of the shoal, she ought to haul more to the W., and keep in from 12 to 16 fathoms; for the wind often draws to W. or to N.N.W., with a strong current sometimes running to the N. rendering it difficult to get near the land between Point Calimere and Negapatam, when a ship is far out in the offing. In the S.W. monsoon the currents on the E. coast of Ceylon, from 40 to 50 m. off shore, set mostly to the S. or S.S.E., according to the direction of the land. If passing in sight of the low land about Calimere Point, a large ship should not come under 6 or 7 fathoms towards the shoal flat projecting from that point, and you will in this depth pass the point at the distance of 2½ or 3 leagues. Steer afterwards along the coast in 8 fathoms, which will lead outside the 3 fathoms' shoal, situated to the S. of Negapatam; and when the white house, which is about 5 m. to the S. of that place, bears to the S. of W., you are clear of its N. extreme, and may haul in for the road, and anchor in 5 or 5½ fathoms.

CALIMERE or CALYMERE POINT (the beacon) in lat. 10° 18′ N., lon. 79° 52½ E., is low, covered at high tides, and not to be approached under 5½ or 6 fathoms; the two pagodas, called Point Calimere Pagodas, in lat. 10° 22½ N., lon. 79° 51½′ E., stand E. and W. of each other, about 1 m. inland, and 5½ m. to the N.N.W. of the beacon on the point. From these pagodas the direction of the coast is about N. ½ W. to Negapatam, distance 20 m.; all the land in this space is low, and planted with cocoa-nut trees near the sea. In lat. 10° 28½′ N., about 6 m. to the N. of the two pagodas, there is a remarkably tall cocoa-nut tree by itself, and 3 m. farther a *tuft* of the

same trees much higher than the rest, which bears W. from the S. end of Negapatam Shoal. In lat. 10° 36′ N., about 5 m. to the N. of the tuft of trees last mentioned, there is a clump of thick bushes, or small trees, a little elevated, which is the first thing seen in making the land from the S.E.: and it rises in the form of a saddle, when viewed from 17 or 18 fathoms water, 5 or 6 leagues off shore. This *saddle-bush* is at a small distance from the sea, and about 1½ m. to the S.S.W. of a sand-hill near the beach, which has on it some cocoa-nut trees, and bears due W. from the N. end of Negapatam Shoal; close to the sand-hill, on the N. side, a *white* house is perceived among the trees near the beach, which is also a mark for the N. end of the shoal.

Negapatam Shoal extends nearly N. and S. about 6½ or 7 m., and is little more than 2 cables' lengths across on any part; it is composed of hard sand and stones, having from 24 ft. on its S. part to 19 ft. at its N. part. About mid-channel between it and the shore, the depths are from 3½ to 4½ fathoms, and 5 fathoms close to its inner edge. The S. end of the shoal is distant from the beach about 3 m., and the N. end about 4 m. The depths close to the shoal on the outside are 6 and 7 fathoms; therefore, a ship bound to the N. ought not to come under 7½ fathoms until to the N. of the sand-hill and white house among the trees near the beach, or until Negapatam flag-staff, or the black Pagoda bears N.W. ½ W., or N.W. by W.; she may then haul in, over some knolls that lie near the head of the shoal, and if the flag-staff bear to the N. of N.W. ½ W., will have overfalls of 7 to 5 fathoms on them. From 21 ft. water on the N. point of the shoal, Negapatam flag-staff bears N.W. distant 8 m., and the sand-hill about W. The 3-fathoms patch of Negapatam Shoal is in lat. 10° 36′ N., abreast of the *saddle-bush*, above noticed.

The Anchorage at Negapatam during the fair season is in 5 or 5½ fathoms, soft ground, with the flag-staff about W. or W. by S., off shore 1½ or 2 m. When the weather is unsettled, ships should anchor out in 6 or 7 fathoms, with the flag-staff W. ½ S., and the highest of the five pagodas N.W., good holding-ground. Fresh provisions for present use may be obtained, with vegetables, fruit and rice; but fire-wood is scarce. The watering-place is at a great tank, about ½ m. up the river. Ships generally employ the country boats to bring off water, as it might be dangerous to use their own, on account of the surf, which breaks high on the bar with any swell. The rise of tide on the springs is about 3 ft.; H. W. about 5 h. on F. and C. of moon.

NEGAPATAM (the Fort) is in lat. 10° 46′ N., lon. 79° 50′ E. The town lies to the N. of the Fort, near the entrance of a little river capable of receiving small country vessels, which has a N. and S. entrance, the land between them being an island; the boats use the windward entrance in passing out, and the leeward one in returning, according to the monsoon. The bar is tolerably smooth in fine weather, when ships' boats may go over it into the river; but they cannot land anywhere else, on account of the surf. A considerable trade is carried on at this place by small coasting vessels; and, as it is now the terminus of the Great Southern India Railway, a good number of ships and steamers make use of this roadstead. An Act passed in 1867 by the Madras Government, decrees that "The ports of Negapatam and Nagore shall be treated as one and the same port; every vessel, in respect of which port-dues shall have been charged and taken at one of the said ports, being exempted from the charge of entering the other port." About 1½ m. N.N.W. from the Fort, stands the old *Black* Pagoda, which is one of the most conspicuous objects in approaching this part of the coast, the whole of it having a low, drowned aspect when first seen from the offing, and is mostly a sandy, barren soil, planted with cocoa-nut trees in many places.

Light. Negapatam now shows a *fixed* light on a white tower, at 82 ft. above sea, and visible 12 m. off, in lat. 10° 46′ N., lon. 79° 50′ E.

Nagore five White Pagodas are in lat. 10° 49′ N., distant about 4 m. from Negapatam, or 3 m. from the *Black* Pagoda, the direction of the coast between them being nearly N. These *White* Pagodas are excellent sea-marks for distinguishing Nagore River, which is close to them on the N. side, and where a great trade is carried on in piece-goods, rice, &c. There are 8 ft. on the bar at H. W. during the springs; the rise of tide about 3 ft., and it flows to 8¼ h. Several vessels of 200 and 300 tons burthen belong to this place, and are navigated by natives, who conduct them to the coast of Sumatra, Acheen, Malacca Strait, and other parts on the E. side of the Bay of Bengal, where they have a constant trade. The anchorage in the road is 2 or 3 m. off the entrance of the river, in 5 or 6 fathoms, with the five *White* Pagodas W.S.W. or W. by S. The coast is low, and at times inundated near the mouth of the river.

Karikal, or Caricall, a small French settlement subordinate to Pondicherry, about 10 m. to the N. of Negapatam, and about 2 leagues from Tranquebar, may be known by a bushy tree near it. Ships may anchor abreast this river in 5 or 6 fathoms; but the entrance is not easily perceived, being formed by a narrow point of sand extending along the coast: the opening is to the N., nearly parallel to it, which is the case with most of the rivers hereabout. To the S. of Karical River about a mile, is Colluncherry River; and between this and Nagore is Tiroomale River: the bars at the mouths of

these small rivers render them navigable only at H. W. by boats, or small country vessels called chilingas.

Light. On Karical Flag-staff, in lat. 10° 55′ N., lon. 79° 50′ E., a *fixed* light is now shown, 65 ft. above H. W., and visible 8 m.

TRANQUEBAR, in lat. 11° 1′ N., lon. 79° 51′ E., bears about N. from Nagore, distant about 4 leagues; and is easily known, by the fort and houses having a neat appearance, and being generally very white. In coasting along from Negapatam to Tranquebar, the shore may be approached to 6 fathoms; the depths are 5 fathoms about 2 m. off, 7 fathoms about 3 m., and 12 fathoms about 6 m. off shore. In passing the river at Tranquebar, a ship ought not to come under 6 or 7 fathoms, on account of a bank projecting to a small distance from the shore. From Tranquebar, the coast extends nearly N. about 7 leagues, to the entrance of Coleroon River, and may be approached to 6 or 7 fathoms, regular soundings; but 10 or 11 fathoms are good depths to preserve in coasting along. To the N. of Tranquebar, at 2 leagues' distance, lies the village Caverypatam, in lat. 11° 8′ N., close to the mouth of the river called New Cavery, and near it two small pagodas stand at a little distance from the sea.

The small river Trimul-vassel, taking its name from a pagoda that is seen inland, is about 2 leagues to the N. of Caverypatam, having a bank stretching nearly a mile from its mouth; but as the depth in the approach to it gradually decreases, it is not dangerous. The land to the N. of this river is rather higher than the coast to the S., which from Point Calimere is all very low, and only discerned from the offing by the trees and buildings. On the S. part of the coast, the bank of soundings is very flat to 20 fathoms about 5 m. off; but from 70 fathoms about 8 or 8½ leagues from the land, it has a steep declivity to no ground, 100 fathoms. To the N. of Nagore soundings do not extend so far out, the depths from thence being generally 40 or 45 fathoms about 5½ or 6 leagues off shore, and the bank shelves suddenly, from 45 or 50 fathoms to no ground.

Coleroon River, in lat. 11° 23′ N., has within the entrance a small island, with the Fort of Devicotta, and may be known in coming from the S. by the land terminating in a point on the S. side the river, the direction of which being first N., from thence turns to N.N.W. and N.W. by N. about 3 leagues, to Porto-Novo, forming a kind of bay. But the best mark to know this place is a thick plantation of trees near the sea, called Coleroon Wood, which is higher than the other land, and when first seen from sea, appears like a low, level island, sloping towards each extreme. Inland are situated four remarkable buildings, called the Chalambram Pagodas; when just touching the S. part of Coleroon Wood, they bear W. ¼ N.; when on the middle of it they bear W.; but will not be perceived if a ship is well in shore, until they open to the N. of the wood, bearing then W. by S. ½ S.

Kodiampolayem, in lat. 11° 22′ N., is a village near the mouth of Coleroon River, and is the N.-most port of Tanjore district. Then commences the district of South Arcot, which extends to Covelong, beyond that to Pulicat is the district of Madras

COLEROON SHOAL projects 5 m. to N. from the river entrance, and stretching to the S., joins the shore about the S. part of Coleroon Wood; the inner part of it is dry at L. W., and from 11 to 12 fathoms near the outer edge, it is steep to 3 or 4 fathoms. A large ship, in coasting along here, should not come under 15 fathoms in the night, nor under 12 or 13 fathoms in the day, toward this dangerous shoal. H.M.S. *Falmouth*, standing in towards the shoal in the night, intending to tack in 12 fathoms, but missing stays, got into 4½ fathoms, and was obliged to anchor; the weather being moderate, they warped out in the morning and made sail. It may be observed that the water shoals more suddenly in standing towards the shore about Coleroon than at any other part of the coast. When the S. Chalambram Pagoda is on with the S. part of Coleroon Wood, you are abreast the S. end of the Shoal, which does not extend far out. When the two middle Pagodas are in one, bearing W.S.W., and Porto-Novo flag-staff W. by N. ½ N., a ship will be in 12 fathoms, near the N. end of the Shoal, which is here nearly 3 m. distant from the shore: but a ship bound into Porto-Novo should bring the flag-staff W. by N., when the two middle Chalambram Pagodas are bearing W.S.W. ½ S., she will then be clear of the N. end of the shoal, and may haul in for the Road; or if in 18 or 20 fathoms, she may haul in for it, when the flag-staff bears W.N.W.

Porto-Novo, in about lat. 11° 30′ N., and 3 leagues N.N.W. of Coleroon River, is a place of some trade, and the road affords good anchorage in S. winds, being sheltered from these by Coleroon Shoal, which breaks the swell. Ships may anchor in 6 fathoms, mud, good holding-ground, with the S. Chalambram Pagoda S.W. ¼ W., and Porto-Novo flag-staff W. ½ N., off shore 2 m. The river is small, navigable only by boats and country vessels. Water is procured from a tank a little way up, but it is brackish, and of a pernicious quality. There is an iron-foundry here, the light from which, it is thought, may sometimes be mistaken for the light at Pondicherry. (*See* remarks on Pondicherry.)

Cuddalore Town and River, in lat. 11° 43′ N., lon. 79° 46′ E., bears from Porto-Novo nearly N. by E., distant about 3 leagues: the coast is safe to approach to 7, 8, or 9 fathoms, from 2 to 3 m. off shore. A little to the N. of Porto-Novo begin white sand-hills near the sea, which extend along shore, and from the offing appear like islands, being higher than the adjacent coast. The anchorage at Cuddalore is in 5 or 6 fathoms, good ground, with the flag-staff N.W. by N. to N.W. ½ N., and the first tuft of trees to the N of the bar N.W. by W., when the back-water or river will be distinctly seen; and the flag-staff will appear between two high, sandy hillocks, but rather nearer the S. one, and the white building and church in the centre between the S. sandy hillock and the tuft of trees at the bar. The river is small, shut up by a bar at the entrance, and navigable only by boats. Water, fresh provisions, vegetables, fruit, and other refreshments, are got at this place. The ruins of **Fort St. David** lie 2 or 3 m. to the N. of Cuddalore, from which a bank projects a little more than ½ m. to sea-ward. From Cuddalore to Pondicherry the coast extends about N. by E. 5 leagues, being low and sandy near the sea, and may be approached with safety to 8 or 9 fathoms, the soundings decreasing regularly to 7 fathoms about 1 or 1½ m. off shore. From 42 or 45 fathoms, about 6 leagues from the land, the bank has a steep declivity to no soundings. In coasting along from Point Calimere to Pondicherry, a ship may at discretion keep in soundings between 10 and 14 fathoms; except when passing Coleroon Shoal, she ought not to come under 13 or 14 fathoms. Captain Driver, of the ship *Clyde*, states that he got into shoal soundings on a bank off Cuddalore: having made the land off Porto-Novo, and steering occasionally N.N.E. along the coast, in 12 and 13 fathoms, shoals suddenly to 5 fathoms, and had many casts from 5 to 6½ fathoms, then hauled more off, and soon deepened.

PONDICHERRY, in lat. 11° 56′ N., lon. 79° 50′ E., is situated close to the sea, and easily distinguished by its numerous buildings, having an agreeable aspect when viewed from sea-ward. To the N.W. of the town, on a long, flat hill, there is a piece of remarkable black land at a small distance in the country, having on it a grove or tuft of trees, which is the first thing discerned in approaching this part of the coast, and is a good mark to know Pondicherry. There is a small river, into which the country boats and small vessels enter, when trading to this place. In the fair-weather season, from Jan. to Oct., the common anchorage in the road is abreast the town, in 7 or 8 fathoms, about ¾ m. from it; small ships may moor in 5½ or 6 fathoms; but during the season when stormy weather may be apprehended, it is prudent to anchor well out, in 12 or 14 fathoms, in what is called the outer road.

Light. A *fixed* light has been established in the square since 1836. It is exhibited all night. 131 ft. above sea level, and may be seen, in clear weather, 14 m. During the N.E. monsoon, that is from Oct. to March, vessels arriving in the night may find good and convenient anchorage in 10 or 12 fathoms, with the light bearing by compass from W. to W.N.W. During the S.W. monsoon, from March to Oct., bad weather is not to be apprehended, and vessels may then anchor at night in 6 or 7 fathoms, with the light bearing by compass from W. to W. by N. The positions for anchoring, here recommended, are those which, in the respective seasons, will be found most convenient for communication with the shore.

Caution. The light from the chimney of an iron-foundry at Porto-Novo, 10 leagues to the S., may sometimes be mistaken for Pondicherry Light; an error which might be productive of disastrous consequences. In clear weather the distinction between the two lights would be sufficiently obvious, from the foundry light changing its brilliancy at the time of feeding the furnaces; but in hazy weather this change might be attributed to the variable state of the atmosphere; in which case the soundings must determine the position of the ship. A vessel from the S., and bound for Pondicherry, being in doubt respecting the light seen on the coast, should immediately be put under easy sail, and keeping in readiness to manœuvre, stand in shore when the wind will permit, and endeavour to make out the light. The lead should be kept constantly going in order to receive due warning when to stand off; this being especially necessary near Coleroon, where the water shoals suddenly. In crossing the Coleroon Bank, the bottom is sandy and good for anchorage, should the wind from the sea not be too fresh. There is not sufficient depth of water on some parts of the bank for large ships, and although by bringing either light on a bearing about N.W. by W., all danger is avoided as far as grounding is concerned; yet there would be reason to fear that if a ship was off Pondicherry, the wind would not permit her to lay up sufficiently soon for the road, particularly in the S.W. monsoon, and that she would find herself past it, or at least obliged to anchor too far to the N., and in a position very inconvenient for receiving or discharging cargo, or for communicating with the shore.

The coast, from Pondicherry to Sadras, is 15 leagues, and the direction nearly N.N.E.; but the mouth of the Palar river is more prominent than any other part, and bears N.N.E. ½ E. from Pondicherry. The shore is in general low, with sand-hills in some places fronting the sea; from

10 to 14 and 15 fathoms are good depths to keep, in sailing between these places. From 42 or 45 fathoms, about 5 or 6 leagues off shore, the bank shelves suddenly to no ground. The bottom is mostly sand or gravel in the offing. **Conjimeer, or Coonemode,** a small river, where there are some ruins of buildings, is distant about 4½ leagues N.N.E. from Pondicherry; between them sand-hills extend along the coast; and behind these, the black land from the back of Pondicherry, gradually decreasing, terminates about 1 m. to the S. of Conjimeer. Abreast of this place the anchorage is good in 6 to 8 fathoms, about 1½ or 2 m. off shore. **Mercanum,** in lat. 12° 12′ N., a place of salt manufacture, having a good road into the interior, is on a back-water about midway between Pondicherry and the Palar river. **Alemparva,** in lat. 12° 16′ N., bears nearly N.N.E. ½ E. from Conjimeer, about 3 leagues; a thick wood and a village are perceived, from whence to the S. point of Alemparva river, which projects a little into the sea, the coast is rather low. The N. side of the river is covered with trees, and several small hills appear in the country.

Palar River Mouth, in lat. 12° 27′ N., bearing N.N.E. ½ E. from Alemparva Fort, has its source in the Mysore country, and it flows past Arcot and Chingleput to the sea, about 4 m. to the S. of Sadras, where it forms a prominent part of the coast; its entrance is contracted by a bar, or narrow ridge of sand, inside of which the river becomes of considerable width.

SADRAS, in lat. 12° 32′ N., lon. 80° 10′ E., bears from the entrance of the small river Alemparva N.N.E. 6½ leagues; the coast between them is generally barren, with some sand-hills; and few trees appear till within 3 leagues of the former place, where is the S. extremity of a thick wood of Palmyra-trees, extending about a league along shore to the N. Abreast of this wood, the shore being more flat than to the N. or S., a ship in passing should edge out a little, into 11 or 12 fathoms. There is another wood about 5 or 6 m. to the N. of the former, which appears to project in a point when viewed from the S. From abreast the S. part of this wood, the flag-staff of Sadras may be perceived over the trees that hide the town; for this place is not easily discerned from the sea, on account of the trees with which it is surrounded. Two pagodas may be seen in passing, one to the S., the other to the N.; but they are not very conspicuous. This part of the coast is known from sea-ward by a ridge of hills inland, at the back of Sadras, some of which are very rugged; and this ridge is generally called the High Land of Sadras, or Sadras Hills. When the highest of these bears N.W., the town of Sadras is nearly abreast.

The coast from Sadras to Madras, extending N. by E., and N. ½ E., about 11 leagues, is generally low and woody near the sea; but inland there are high hills. In coasting along, from 12 to 17 or 20 fathoms are good depths to preserve. Come not under 12 or 14 fathoms in a large ship, particularly in the night, when to the N. of the Seven Pagodas, on account of the reef of Tripaloor. On this part of the coast, the bank, as before, has a sudden declivity, from 40 to 45 fathoms, sand or gravel, about 5 or 6 leagues off shore, to no ground. About 3 or 4 m. off shore at Sadras, the depths are 9 and 10 fathoms, but to the N. of that place the coast becomes more steep, those depths being about 2 or 3 m. off.

The Seven Pagodas of Muliveram, about 7 m. to the N. of Sadras, are not discernible except when well in with the land: two of them are near the sea, one of which, standing on a rock, is washed by it, and is now nearly destroyed, although this pagoda, *it is said*, formerly stood at a considerable distance inland, the sea having encroached greatly on the land; four of them are in the valley near the foot of the S. high land, and the other on its extreme point: the view of those in the valley is often intercepted by the woods, particularly when they bear to the W. From the Seven Pagodas to Covelong, the coast extends N. by E. ¼ E., about 3½ leagues; between them **Tripaloor Rocky Shoal,** in lat. 12° 37′ N., projects about 1 m. into the sea, and bears about S.E. by S. from the small hill of Tripaloor, known by being much nearer the shore than any of the others. This reef should have a proper berth in passing, for it appears to be steep-to, as hereabouts the *Rockingham* ship struck upon a rock and soon bilged; had 6 fathoms under the bow, 6½ a little way ahead, 5½ under the stern, and 4 fathoms at the main chains. From the wreck two of the Seven Pagodas bearing S.W., and the extremes of the land from N. to S. by W., *estimated* distance off shore about 2 m. **Covelong,** about 17 m. to S. of Madras, is a village now, but was formerly a large town with a fort, called Saadut Bunder. It is 9 m. above the Seven Pagodas, and is a projection of the coast with a dangerous reef extending from it more than 1 m.

Covelong Reef, from 16 m. to 18 m. to the S. of Madras Light-house, seems to extend for some distance off shore to the N.E. of Tripalore Hill. Vessels should not bring the Madras *flashing* light (seen best from a little way up the rigging) to the E. of a N. bearing, when abreast of Covelong.

St. Thome, St. Thomas, or Milapore, in lat. 13° 1′ N., bearing from Covelong N. ½ E., about 5 leagues, is a small town close to the sea, having near it a plantation of Palmyra trees; the inland country is hilly, and the N.-most hill, called Mount St. Thomas, in lat. 13° 0½′ N., about

4½ m. from the sea, is easily known in sailing along; being lower than the others, regular and sloping in its shape, crowned with a church. There are other buildings and trees in its vicinity. From St. Thomas the coast stretches N. by E. nearly 4 m. to Madras, and is low towards the sea, but safe to approach to 9 or 10 fathoms: between them a black pagoda is seen in passing. The mouth of the Adyar River is about 4 m. to S. of the light-house.

From Point Calimere to Madras the greatest part of the coast is lined with a sandy beach, having a great surf rolling in upon it during both monsoons, which renders it hazardous and imprudent to land at any time in a ship's boat. Along the whole extent of coast, on this side of the peninsula, to Bengal River, the country boats are peculiarly constructed for passing through the surf; being built without timbers, with their planks sewed together, they bend to its force, and are very easily repaired.

MADRAS, or FORT ST. GEORGE, is the principal settlement on the coast of Coromandel, and the seat of the Governor and Council of that Presidency. The town within the walls of the fort, where most of the Government offices are, is composed of neat and well-built houses, with flat, terrace-roofs. The Black Town, which is larger, lies to the N., at a small distance, inhabited by Hindoo merchants, Moors, Armenians, Jews, &c., with some Europeans, who have not houses in the fort or in the extensive suburbs of Madras. A small river or canal extends around great part of the walls of the fortifications, adding considerably to the security of the place, which *was* formerly deemed a very strong fortress. It is a place of great trade, and the coast, although sandy close to the sea, becomes fertile and of an agreeable aspect at a small distance inland; the water is excellent, and plenty of all sorts of provisions may be procured for a fleet of ships, but fire-wood is scarce. There is railway communication now with Bombay as well as with Beypore. The Electric Telegraph communicates with all parts of Europe, and with most parts of Asia. We lack space for a full description of the trade and resources of Madras, which we hope to see soon increased by the creation of a harbour, where ships may load and discharge cargo at a wharf. But the name of Captain Christopher Biden, for so many years the worthy and zealous Master-Attendant, may be remembered as the framer of the Port Rules, from which we extract the following portions.

Port Regulations. All ships and vessels, other than those commonly known as dhonies, or native vessels, are directed to anchor with the Master-Attendant's flag-staff, bearing between N.W. and W. ½ N., which will be found the most convenient anchorage for merchant vessels. The S. limits of the roadstead are usually resorted to by men-of-war, or with the light-house bearing from W. by N. to due W., in from 9 to 7 fathoms, which is the limited range of soundings throughout the roadstead. Any ship or vessel anchoring without those limits, or in more than 9 fathoms, will be liable to extra boat-hire.

Commanders of all vessels, coming to anchor in these roads, are advised to attach a buoy to their anchor; whereby giving foul berths may be avoided, and the position of a lost anchor will be indicated. All vessels should take up such a berth as will enable them to *wear* clear of all danger, in the event of casting in-shore when they weigh or part from their anchors; especially as the ground-swell, so prevalent here, tends, in spite of all precautions, to cast a vessel in-shore.

As ships have frequently parted, and accidents have happened, by riding with too short a scope, the Master-Attendant thinks it his duty to caution all Commanding Officers that no vessel is safe with less than 60 fathoms of cable in moderate weather, and 80 fathoms (or more) with a swell. Those unacquainted with Madras Roads may be told that, should any jerk be felt, either on the windlass or bitts, when riding with a chain (from the heavy swell which rolls in at times), cable should be veered until the jerk * is no longer felt, to prevent parting, and a second anchor should always be ready to let go. Efficient ground-tackling is essential to the safety of vessels in these roads

Surf Signals. As the surf breaks very high on the beach, the country boats are employed on all occasions where communication with the shore is requisite. The boats belonging to the ships in the road frequently proceed to the *back* of the surf, where they anchor on the outside of it, and call the boats from the beach to carry on shore their passengers. When the weather is unsettled, with a heavy swell rolling in, the surf is often very high, rendering it dangerous for any of the country boats to pass to or from the shore; when this is the case, a *red and white chequered flag* is hoisted at the Master-Attendant's flag-staff, to caution all persons against landing from ships, which should be carefully attended to, for *many* lives have been lost through the temerity of Europeans proceeding to pass through the surf in defiance of the admonitory signal. When the surf is impassable, the First Distinguishing Pendant will be displayed *under* the other flag.

* We strongly recommend Saunders' Patent Springs for ships' cables.

The following signals are also made from the same place:—

Flag, white, with blue cross..... Weather suspicious, prepare for sea.
—— red, with swallow-tail ..... Cut or slip.

After sunset, an approaching gale is indicated by three lights being hoisted; one at the flag-staff head, and one at each yard-arm; and a gun is fired every five minutes, for one hour, or for such time as may be deemed necessary, and masters are required to acknowledge seeing these signals, when made, by hoisting a good light at the peak, or other conspicuous place, most convenient.

Madras Roadstead is open to all winds excepting those that blow from the W., off the land, and there is generally a swell tumbling in from sea-ward, making ships labour or roll considerably at times. Many lost anchors are scattered about in the N. part of the road. To the S., where large ships moor in 9 to 11 fathoms, it is more clear. The bottom in many places is stiff mud, from which it is sometimes difficult to extricate the anchors. To moor in 9 fathoms, with the flag-staff from N.W. to W.N.W., is a good position for a large ship, where she will be about 1½ m. from the shore; but ships having a cargo to discharge often moor in 8 or 9 fathoms abreast the Master-Attendant's flag-staff, with it bearing W., or W by N. In the bad-weather season it is prudent to anchor well out, and keep the ship ready to proceed to sea, should circumstances render this advisable. The gales generally commence at N.W., blowing strong from the land, with which ships can run off shore before the wind veers to the N.E. and E., when it would be impossible to get out to sea. From beginning of Oct. to mid-Dec. is considered the most dangerous season to remain in Madras Road, or at any other ports on this coast. Gales also happen in April and May,* notwithstanding which, ships are found in Madras Road at all times, for these gales are not frequent; and if a ship be kept in good condition for proceeding to sea, embracing the opportunity to weigh, cut, or slip, and run out on the first approach of a gale, there is probably little danger to be apprehended; but many ships, by remaining at anchor, have at various times been driven on shore. The severe storms at Madras generally commence from the N. or N.N.W., shift to the N.E. and E., where it blows a hurricane, and then veer to S.E., raging with equal violence. The holding-ground in Madras Roads is good, but there is generally a heavy swell from sea-ward, especially if the wind remains long at E. The only dangerous time for large vessels is during a cyclone, which happens about once in nine years. When strong E.N.E. winds blow for any length of time in the N.E. monsoon, a heavy sea rises which few native vessels can ride out, and getting under weigh is difficult, as the wind is nearly *dead on* to the shore. Many vessels and lives have been lost in these short E. gales, which seldom last more than twelve hours, and do not affect the barometer at all, although it gives timely notice of a cyclone.

In fine weather, the surf breaks about 300 ft. from shore, and in squally weather about 450 ft. When it blows hard from the E., it breaks nearly 1,000 ft. from the beach; but on these occasions it is difficult to distinguish the break of the surf from that of the sea. In ordinary weather, the surf-wave is not above 8 ft. high; in rough weather, about 6 ft.; and during a gale 12 or 14 ft. When the land-wind blows *dead off* shore, the surf-wave is often very high, but then there is only one slow heavy roller, and boats can lie by for it, better than when the surf is lower, but quick, following, and confused. There is not so much danger in crossing the Madras surf as commonly supposed. Return cargo-boats now and then get swamped through negligence, but accidents in passenger-boats are almost unknown. Coming on shore in a heavy surf is more dangerous than going off, as it is more difficult to keep the boat *end on*. The Masoolah boat is the only kind of boat that is fitted for the surf, and is not injured by bumping on the sand when landing; they carry about 1½ tons of dead weight.

Current. In the beginning, and during the strength of the N.E. monsoon, the current sets strong along the coast to the S.; it is at its maximum strength (2½ to 3 knots) in mid-Nov.; sometimes 2 knots an hour in Dec., but abates in Jan. During the S.W. monsoon, particularly in the early part, after 1st of Feb., the current frequently runs equally strong to the N., which makes it necessary for ships to fall in with the land to windward of the port to which they are bound. The winds are then between S.E. and S. by W., the *along-shore* winds. This caution ought not to be neglected by ships that sail indifferently upon a wind. The *Lushington*, in Feb., made the land at Pulicat, and anchored in 7 fathoms, with the flag-staff N.W. by W., the current running strong to the N.; with sea-breezes scant at S.E., and land-breezes at S.W., she was two days getting to Madras. The *Duncan*, *Madras*, and *Anna*, also fell in with the land a little to the N., 5th Feb.,

* For monsoons and gales in the Bay of Bengal, and at Madras, *see* pages 317 and 318.

and did not reach Madras till the 7th, at midnight. Ships approaching Madras after the 1st Feb., ought, therefore, not to make the land to the N., but endeavour to steer direct for it, or rather to make it bearing to the N.W., particularly if the wind be Southerly. In the opposite season, from Sept. to Feb., ships should endeavour to make the land a little to the N., or with the light-house bearing S.W.; for many ships which made the land a little to the S. of Madras in the N.E. monsoon, have been from one to two and three weeks gaining a few miles to the N., and with the utmost difficulty reached the port. The maximum velocity of the current appears to be 3 m. per hour.

Tides. It is H. W. on F. and C. of the moon at 7 h. 30 m., and the rise of tide at the highest springs is 3½ ft. nearly. During a heavy gale from the E., the sea has risen 6 ft.; and, in a hurricane, as much as 10 ft., then washing over the roadway or *bulwark*.

Light. Since 1841 there has been a good light-house, in lat. 13° 5′ N., lon. 80° 17′ E., on the esplanade N. of Fort St. George, exhibiting at 132 ft. above the sea, a light *flashing* every two minutes, to guide ships clear of the Pulicat Shoal and into the road, and seen in clear weather 6 to 8 leagues. From the S.E. extremity of the Pulicat Shoal the light bears S.S W. 16 m.; but no ship, when hauling in from the N. for Madras Road, should bring the light to bear to the S. of S.S.W. ½ W., unless her position be well ascertained. A serious risk may be incurred by incautiously approaching the dangerous vicinity of the Pulicat Shoal, as hazy weather or other causes may obscure the light; true soundings and a vigilant look-out are imperative.

The Observatory at Madras is in lon. 80° 14′ 20″ E., or 2′ 40″ W. from the light-house.

The Time Ball, by which vessels can regulate their chronometers, is dropped on the Custom-house, near the base of the screw-pile pier, at 8 h. 20 m. 57·3 sec. a.m. of Madras Observatory time, corresponding to 3 h. a.m. of Greenwich mean time.

Vessels may ascertain the error of their chronometers, by noting the time of the flash from the 8 o'clock evening gun, which, being also noted at the Observatory, is given in Madras mean time from the Master Attendant's office the following morning. Too much reliance, however, should not be placed on this method, as the flash cannot at all times be distinctly seen at the Observatory

The Screw-pile Pier, which starts in an E. direction from the sea-bulwark by the Custom-house, is 40 ft. broad and upwards of 1,000 ft. long, with a T-shaped head, which is 160 ft. long in a N. and S. line. Railway lines are laid down along the main pier, and the rest of the breadth is for foot passengers. There are six fixed and eight movable cranes on it, and goods and heavy machinery are landed at certain fixed rates. All goods landed, which are subject to duty, will be discharged into the Custom-house. All goods landed, which are free from duty, will be discharged at the inner end of the Pier, from whence parties must make arrangements for their further removal. Water is supplied to shipping at 2 annas per ton; this is brought to the Pier-head by pipes from the seven wells on the N. side of Black Town. The Madras Railway has one terminus on the beach on the N. side of Black Town, and 3 furlongs to the N. of the Screw-pile Pier.

Enore, a village in lat. 13° 14′ N., bears from Madras N. by E. ½ E., distant 3 leagues; and about 1¼ m. to the S. of the village stands Enore House, close to the sea. Nearly a league to the N. of that house is situated the S. extremity of **Pulicat Shoals,** bearing about E.S E. from a thick tope of trees, which is the first to the N. of Enore House, and may be known by two trees at its S. extremity, separated from the rest. The sea generally breaks about 1½ m. from the shore, on the S. part of the shoal or reef opposite the tope of trees, there being less water on this part than anywhere else,—1 and 2 fathoms. The most projecting and dangerous part of the reef is a place with 3 and 3½ fathoms, hard sand, distant 3 to 5 m. from the S. part mentioned, where it breaks, and the same distance off the shore abreast, having 10 and 11 fathoms very near it on the outside. Between this 3-fathoms bank and the S. part of the reef that breaks, there is an inner passage (which requires a pilot) leading to **Pulicat Road, or Anchorage,** which is in 7 or 8 fathoms, from 1 to 2 m. off shore, abreast of the light-house, which is by the old flag-staff. Large ships ought to pass outside, and if bound into Pulicat Road, should not come under 13 or 14 fathoms, until the flag-staff is brought to bear W. by N.; they may then steer for it, and will not have less than 5½ or 6 fathoms, sandy bottom, in crossing the N. tail of the reef. Between Enore House and Pulicat, the shore presents a regular convex front to the sea, and from Madras is low, abounding with trees to the S. of Enore. Inland there is a high chain of mountains, called the High Land of Pulicat, or Pulicat Hills, at the S. part having a small piece of table-land, or hill, called **Kettle Bottom,** which bears W. from Pulicat Flag-staff, and W.N.W. when on with Enore House. In lat. 13° 22′ N., lon. 79° 45′ E., a little to the S. of Kettle Bottom, there is a hill less elevated, called **Naggery Nose,** remarkable by a small crooked knob on it, bent over to the S., and resembling a horn.

Pulicat Light. The Light-house, in lat. 13° 25′ N., lon. 80° 20′ E., exhibits a *fixed* red light on a white tower in the position of the old flag-staff, at 73 ft. above the sea, visible 6 or 7 m

Mariners are reminded that when this light bears W. ½ N., a vessel will be to the N. of the shoals, and the Madras Light should not be brought to the S. of S.S.W. ½ W.

From Madras Road, to pass clear of the reef stretching along the coast from Enore to Pulicat, the course is N.N.E., and the distance about 6 leagues to its outer edge, about 3½ m. off shore to the S.E. of Pulicat. At this part it is steep, from 10 and 11 fathoms to 4 and 4½ fathoms, and should not be approached under 12 or 13 fathoms in a large ship; neither ought the S. extremity of the reef to be borrowed on under these depths. In steering along the coast from Madras, a ship ought not to shoal under 12 or 13 fathoms, particularly in the night; she ought to keep out in 16 or 17 fathoms when abreast of Pulicat Shoals, which are most projecting with the Red Light of Pulicat bearing about N.W. by W.; but in hazy, thick weather, this might not be seen. If the Madras Light is discernible, it must bear to the W. of S.S.W. ½ W. in passing those shoals. The depths are from 45 to 50 fathoms on the outer edge of the bank of soundings, about 3 or 3½ leagues off shore, on this part of the coast, which is steep, and from 18 to 20 fathoms about 4 and 4½ m. off shore As the depths decrease suddenly from 18 to 15 and 11 fathoms, then to 4½ or 4 fathoms on the edge of Pulicat Reef, the *hand lead* is of little use.

Armegon, Armogham, or Doogoraspatam, in lat. 14° 1′ N., lon. 80° 10′ E., bears nearly N.N.W. from Pulicat, distant 12 leagues: about half-way between them Point Pondy projects considerably into the sea, with a shoal off it about 2 m. to the S.E.; from Point Pondy the shore-line recedes to the N.N.W.

ARMOGHAM SHOAL nearly joins to the shoal that fronts Point Pondy, its S.E. extremity bearing N.N.E. from that point, distant 2 m., and from thence it extends about N. by W., parallel to the coast 3½ leagues, till opposite the entrance of Armogham River, its outer edge being 2 leagues distant from the shore. The depths on it are generally from 3½ to 1¾ fathoms, but on its S. part, to the N. of Point Pondy, there are only 2 fathoms in some places, where it occasionally breaks; very near its outer edge you find from 7 or 8 to 9 and 10 fathoms, increasing quickly to 28 or 30 fathoms at 3 or 4 m. distance from it, in steering to the N.E. Between the inner edge of the Shoal and the coast there is a space, from 3 to 4 m. wide, now called **Blackwood Harbour,** with soundings from 4½ fathoms near the shore, to 6 or 7 fathoms near the Shoal, where ships might anchor with safety in the fair-weather monsoon, near the entrance of Armogham River, by passing round the N. end of the Shoal, with the hill bearing W. ¼ S. There is also a narrow channel, leading into Blackwood Harbour, round the S. end of the Armogham Shoal, between it and the shoal that fronts Point Pondy. But the hill, and also the coast, is frequently so obscured by haze, that the land seems always more distant than it really is; and many ships having got on the shoal without seeing land, induced them to think that this shoal was situated far out from the coast, and it got the name of the *London Bank.* A ship bound from Pulicat to the N., and wishing to keep near the shore, may continue to steer along in 12 to 14 fathoms, and when abreast of Point Pondy she ought not to come under 14 fathoms, to give a berth to Armogham Shoal. Armogham Hill, in lat. 14° 3′ N., and 2½ leagues W. from the entrance of the river, is of regular form, detached from any other high land. If bound into Armogham Road, a ship ought to keep in 11 or 12 fathoms until Armogham Light bears S.W. by S., or the hill bears W. ¼ S., or on with the N. grove at the entrance of the river, which will be seen from the poop, and the Kettle Bottom, *if visible,* will then bear S.W.; she may then steer direct for the hill, and will pass to the N. of the shoal in not less than 6 fathoms, until she anchor opposite the river in 5 or 6 fathoms, within 2 m. of the shore.

Light. A *fixed* light is now exhibited at the village of Moona, or Moonapolium, in lat. 13° 53′ N., lon. 80° 12′ E., 95 ft. above the level of the sea, to facilitate the navigation in the vicinity of the Armogham Shoals, and in clear weather is visible about 15 m. The light bears due W., and 6 m. from the shoalest part, which has 9 ft.

Kistnapatam, or Kalitore, bears from Armogham nearly N. by W. about 5 leagues; the coast between them is low, and may be approached to 6 fathoms; ships anchor abreast of Kistnapatam River in 5 or 6 fathoms. Between it and Armogham, there is a place called Pamanji, near the mouth of the Soornamooky River. From Kistnapatam a sand stretches along the coast to the N., around Point Pennaur, about 4 leagues' distance, called Shallinger Sand, which projects about 3 or 4 m. from the shore, having regular soundings of 4 and 5 fathoms on its outer edge.

Maipadu, lately become a place of much trade, is in lat. 14° 31′ N. Point Pennaur, in lat. 14° 36′ N., formed on a part of the coast, having a convexity to sea-ward, is not remarkable. The Pennaur River mouth is to the N. of the point; and further to N.N.W. are the salt golahs of Varny and Eskapilly, called also Iskapully and Divelan. Still further to N. are those of Jualdine, Ramiapatam, and Pakala.

Pakala (with which is associated the small village of Itamakla), in lat. 15° 20′ N., bears from Point Pennaur about N. by W., distant 15 leagues; the coast between them is generally low,

fronting the sea, and may be approached to 7 fathoms. Inland from this part of the coast there are hills, which may be seen at a considerable distance. The Goondlacamma River mouth, in lat. 15° 27′ N. (near which are the salt golahs of Kuttowputtum), is considered to bound the coast of Coromandel to the N., beyond which the coast of Golconda begins; but the appellation of Coromandel is often applied to the whole of the coast, as that of Malabar is to the whole extent of coast on the W. side of the peninsula.

Kottapatam, or Kuttowputtum, in lat. 15° 26′ N., is the N.-most port of Nellore district, and the shoalest parts of the Mootapilly Shoals bear E. by S. distant 9 m. off shore from this place.

MOOTAPILLY SHOAL (least water 2½ fathoms), is in lat. 15° 23½′ N., and 5 m. distant from the shore, Ongole, or Pillore Hill bearing from it W., distant 17 m. The shoal-patch of 2½ fathoms bears E. by S., and is 9 m. off shore from Kuttowputtum; and it lies S.W. from False Point Divy about 6 leagues. Mootapilly Bank extends to several miles' distance all around the above-mentioned shoal, having in some places hard bottom, with overfalls, from 5 and 5½ fathoms to 8 and 9 fathoms, water. Ships passing here in the night ought not to shoal under 24 or 20 fathoms, nor under 14 or 15 fathoms in the day-time, on the outer edge of the bank, which shelves off from 18 or 20 fathoms to no ground 60 fathoms, at 6 m. distance. The shoal-patch has from 5½ to 8 fathoms near it all around, hard irregular soundings, which do not point out its proximity; several Bengal ships have accidentally got on it in 2½ or 3 fathoms, and were in imminent danger.

COAST OF GOLCONDA.

Mootapilly, or Motupalli, in lat. 15° 44′ N., lon. 80° 17′ E., and about 9 leagues to the N.N.E. of Pakala, is a small village ½ m. inland, not discernible from a ship; but with the aid of a telescope, a small pagoda is perceptible. There are about twenty detached Palmyra trees to the N. of the landing-place, and about a mile to the S. a thick grove of trees with a *clump* on its S. part higher than the rest. With the N. extremity of a piece of high land in one with a thick grove of trees, you are abreast the proper anchorage, in lat. 15° 42′ N. Coming from the S. towards Mootapilly, a vessel may keep near the land in soundings between 6 and 8 fathoms, to pass inside of the 2½-fathom shoal, situated on the extensive bank to the S.E. and S. of Mootapilly.

From Mootapilly to False Point Divy, the coast runs N.E. by E., then E. about 6 leagues to Nizampatam; thence E. by S. and S.E. to the mouths of the Kistnah River, and forms a bay to the W. of the point; in this space the coast is low and woody, having the villages of Pettahpilly, Epoorpaliem, and Nizampatam, with two small rivers near them; Pettahpilly, in lat. 15° 50′ N., may be known by a flat grove of Palmyra trees near it. **Nizampatam,** in lat. 15° 54′ N., lon. 80° 38′ E., is a large town, about 2 m. inland, up a small river, with an extensive coasting trade.

Divy False Point, in lat. 15° 45′ N., lon. 80° 54′ E., projects from the main to S., forming the E. side of Pettahpilly Bay, having branches of the Kistna falling into the sea in its vicinity. A bank of very shoal water projects from this point 7 m., both to the W. and S., requiring caution in passing, as the depths near its edge decrease rather suddenly in approaching from sea-ward, there being 35 and 40 fathoms, 5 miles outside the edge of the bank that extends from False Point along the coast, and around Point Divy; but the depths, from 10 or 12 fathoms on the edge of the bank, decrease pretty regularly to 5 and 4½ fathoms farther inside. Ships coming from Mootapilly ought to steer along the coast in from 8 to 9 fathoms until they approach False Point Divy; then haul out to the S.E., round the shoal flat that fronts it, which should not be borrowed on under 7 fathoms, even during fine weather. The coast from False Point to Point Divy being very low, is scarcely seen in fine weather from a vessel's deck, and not at all in hazy weather from the outer edge of the shoal flat, upon which the corvette *Favourite*, and other ships, have grounded. If the low land of False Point Divy be *in sight* from a vessel's deck, she is much nearer in than prudence allows. There is no correct survey of the mouths of the Kistnah, and its banks are shifting and advancing sea-ward.

Divy Point, in lat. 15° 58′ N., lon. 81° 11′ E., bears from the False Point N.E. by E., distant 7 leagues: the coast between them is low, with a shoal flat extending from it to the distance of 3 m. Ships in passing may occasionally borrow on the flat to 5½ or 6 fathoms with a commanding breeze, as the water shoals gradually; but suddenly in coming from sea-ward on the edge of the shoal. The point is low, and, before the erection of the light-house, was without any distinguishing mark, except some trees covering it; for the low level coast which stretches from it to the N.N.W., forming the W. side of the semicircular bay of Masulipatam, is destitute of them. Around the point, and between it and the former place, several branches of the river Kistnah fall into the sea; the great quantity of earth carried during the rains by these rivers has probably formed the shoal flats along this part of the coast. The rise and fall of tide is seldom more than

4 or 5 ft. in the spring-tides at the mouths of the rivers; but it sometimes happens, when a severe gale of wind blows from the sea, that the low land is inundated, causing great destruction of property and lives. In approaching Point Divy from the E., the depths decrease quickly after a ship gets on the edge of soundings, about 5 leagues off shore; therefore the lead ought never to be neglected, when standing towards it, or any of this low coast.

Light. A *fixed* light on a white column was exhibited 2 m. N.W. of the point in 1851; it is 90 ft. above the level of the sea, and in clear weather may be seen 4 leagues. Divy Light is in lat. 15° 59′ N., lon. 81° 9½′ E. It is said to be visible only between the bearings of N., round by the W., till it bears S.W. Therefore a vessel (especially a fast steamer) must be cautious, when approaching from the S.; and if she gets a cast of the lead, without seeing the light, should at once haul off shore.

MASULIPATAM, in lat. 16° 9′ N., lon. 81° 10′ E., bears nearly N. ½ W. from Point Divy, distant about 12 m.; the coast between them is low and sandy, lined with a shoal flat, having 3½ and 4 fathoms on the edge of it, about 5 m. off shore. With a S. or W. wind, a ship bound into the road may, after bringing Point Divy Light-house to bear about W. in 7 or 8 fathoms, steer along the edge of the flat, shoaling to 5 or 4½ fathoms gradually, as she approaches Masulipatam, which will easily be known after rounding the point, by the appearance of the flag-staff and building; if she get into 4 fathoms, or have a hard cast, she ought to haul out instantly to the E. The shore is flat all round the bay, the depth in approaching it does not decrease more than ½ fathom for the distance of nearly a mile. Ships, in the fair season, generally anchor at Masulipatam abreast the town, in from 4 to 5 fathoms, mud, with the flag-staff from W. to W. by N., off shore 4 or 5 m. This town is situated on a small branch of the river Kistnah, and is a place of considerable trade; the export chiefly cottons, printed in a variety of patterns.

Light. At the flag-staff, a *fixed* Red light is exhibited, at an elevation of 90 ft. above sea-level; it is merely a port-light, and visible only 6 m.

Directions. Ships bound to Masulipatam, from Feb. to Oct., should make Point Divy, taking care not to fall to the N.: in coming from Madras, they should keep in soundings; but to avoid the Armogham Shoal, and the Mootapilly Shoal, they ought not to borrow under 20 fathoms in passing, particularly in the night. When False Point Divy is approached, or the coast between it and the *true* point, they may, with the wind at S.W. or W., haul into 8 or 9 fathoms, decreasing the depth of water gradually when round the point, until they reach the road of Masulipatam. This proceeding is proper during the strength of the S.W. monsoon; but in Feb., March, and April, if the winds incline from S.E. or E., *which sometimes happens*, it will be prudent to keep at a reasonable distance from the land, and steer directly from sea-ward into the bay at Masulipatam. In Oct., Nov., and part of Dec., the weather is very unsettled, the winds generally from N.E. and E., and current running mostly strong to the S.; therefore, ships bound into any of the ports on this coast during these months, should fall in with the land to the N. of the place to which they are bound, for they will seldom be able to gain any Northing when near the land in this season. As most of the roads on the coast are exposed to gales of wind from the sea, which are liable to happen from 1st Oct. to 1st of Jan., few ships remain in them during this period, except on particular occasions. From 10th or 15th of Oct. to 10th or 15th of Dec., is considered the most precarious time. Gales of wind have at times been known to happen during the S.W. monsoon, particularly at its commencement in April or May; a storm has also been experienced in Aug., although bad weather is seldom apprehended when the S.W. monsoon prevails. In May, the coast of Coromandel was visited by a violent tempest, the wind chiefly blowing from N. to N.E., with a deluge of rain, which destroyed much property along the coast, and about Coringah. The sea inundated the low country; several vessels were carried into the fields by the inundation, and afterwards grounded on more elevated parts of the land. One new ship, building on the stocks at Coringah, was swept away into the river and destroyed. In Cuttack, and the low country around Point Palmiras, a devastation of property and loss of life took place by the inundation, followed by famine, whereby multitudes of the natives perished who escaped from the inundation.

Narsapour, or Narsipour Point, in lat. 16° 18′ N., lon. 81° 42′ E., bears from Point Divy nearly N.E. by E. 12 leagues; and from Masulipatam about E. by N. 11 leagues; it forms the E. extremity of the great bay of Masulipatam; and close to it, on the W. side, the river of Narsapour, the W. branch of the Godavery, falls into the sea; the other branches of that river debouche near Point Gordeware, and at Coringah. On the bar of Narsapour River there are 8 or 9 ft. water, and 3 to 5 fathoms inside, in the passage to the town; a shoal bank projects about 3 or 4 m. to the S. and W. of the river and point, on which the sands are liable to shift and alter the channel. Narsapour town is about 6 m. from the river's mouth; and adjoining it is the ancient town of Madapollem, once famous for its cloths, but now half cut away by the encroachment of the river Kistnah

Narsapour was formerly visited by English ships of considerable size, but now is frequented chiefly by native craft. Lightly-laden vessels enter the river by a channel known to the pilots. Cargoes are mostly discharged at Antavedy, near the river mouth. The anchorage in the road is in 4½ to 5½ fathoms to the W. of the point, near the edge of the flat that extends from the river off shore 4 or 5 m. In a direct course from Point Divy, across the entrance of the bay to Narsapour, the depths are from 14 to 24 fathoms, shoaling fast toward either point.

From Narsapour Point, the coast stretches nearly N.E. by E. about 10 leagues, then changes to N.N.E. and to N. for 5 to 6 leagues farther to Point Gordeware; the coast between them is low, and may be approached occasionally to 7 or 8 fathoms; but in a large ship it is prudent to keep farther out, particularly within 3 leagues of Point Gordeware, when she ought not to borrow under 14 or 15 fathoms in the night, which is *only* 4 m. off shore, towards the extensive shoal that surrounds the Point; between these points some streams fall into the sea.

CORINGAH BAY. Gordeware, or Godavery Point, in lat. 16° 49′ N., lon. 82° 20′ E., the S. point of this bay, is a low, narrow sand-bank, extending nearly N. and S. several miles, the N. of it being considered as the Point, though some navigators set the low islands on the W. side of the sand-bank for Point Gordeware, as these are covered with trees and bushes, but partly inundated at H. W. The sands surrounding the Point, on which the sea breaks, extend from it about 3 m. to the N.E. and 5 or 6 m. to N., having channels for boats between some of them. Hope Island is a dry sand-bank to the W. by N. of the Point, its N. part being in lat. 16° 52 N., but the light-house (on its S.W. end) marks it; to the N. of Hope Island the bank consists of soft mud, where it fronts the sea, and the edge of this mud-bank, having 2 and 3 fathoms on it, extends from the N. extremity of the reef, about W.N.W. and W. by N. towards Coconada. A little to the W. of the edge of this bank the bottom becomes hard sand and soft mud alternately; for the whole space between Coringah River and Point Gordeware Reefs consists of channels from the river between banks that are dry, or barely covered at L. W. Much caution is necessary in approaching these reefs and shoals, as they are said to extend much farther than generally supposed, and to be much affected by storms and inundations, which sometimes occur on this coast, and by which great changes are produced. The *James Sibbald*, a fine Bombay-built ship, was wrecked on these reefs on the voyage from Bengal to England. The principal branch of Godavery River is to the N.W. of Point Gordeware.

Hope Island is covered with jungle, but intersected by several channels; and is, therefore, a group of islets, and on the S.W. end stands the Coringah Light-house It bears from Point Gordeware about W. ¾ N. In thick weather this light may not be visible beyond 10 or 12 m., and as the outer edge of the reef is at least 4 m. from the light-house, a ship or vessel may, during such weather, be within 4 m. of the reef before the light or light-house has been discovered; therefore, soundings always require the most prompt and careful attention. Point Gordeware has extended to the N. since the first publication of Horsburgh's Directions, and the reef has also extended its limits both to the N. and E. These changes have shifted the anchorage off Coconada, or in Coringah Bay, farther to the N., and are not in any way detrimental to the safety of that anchorage. The Master Attendant sees to the shifting of the buoys and to the berthing of ships. On account of the rapid increase of the shoals to the N. of Hope Island Light-house, it is most probable that a light-vessel will be placed there. Buoys were placed in August, 1862, the outer or bell buoy in 6 fathoms, N.E. ¾ N., about 5 m. from Hope Island light. Middle buoy in 5 fathoms, N. by E., 6 m. from the light; and the inner buoy in 3 fathoms N. ½ W., 7 m. from the light. Vessels are no account to go inside, or to the S. or W. of these buoys. As the buoys are much exposed to heavy seas, caution is requisite not altogether to depend on their being in their proper position.

The Bay of Coringah is well sheltered, and is only open from N.E. to S E. The anchorage is on good holding-ground, deepening to the N.E.; and a ship or vessel driving on the mud-bank would not sustain any material injury. The mouth of Coringah River is about S.S.W. 7 or 8 m. from the anchorage, and the bar, on which is a ledge of hard sand, with soft mud on either side of it, is distant from the river's mouth about 6 or 7 m.; 9 ft. is about the average height of water near the bar at F. and C. of moon, when it is H. W. at 9 o'clock, and the rise and fall of tide is from 5 to 6 ft. during the springs.

Hope Island Light-house. The navigation of Coringah Bay was improved by the erection of a light-house on S. point of Hope Island, in lat. 16° 49′ N., lon. 82° 18′ E.; it has a *fixed* light, 73 ft. above H. W., and may in clear weather be seen about 4½ leagues; but, as the sand-banks are rapidly gaining upon the sea, and now extend fully 5 m. to the N. of the Light-house, a **bell-buoy** was placed at a distance of 5 m. to N.E. of the Hope Island light, and **two other buoys** between that and Coconada, to guide ships to the proper anchorage. Ships should anchor with the light-house on Hope Island bearing S. by E., and Coconada Light-house S.W., where they will have 4 or 5 fathoms at L. W., soft ground, 2 m. off shore. The bar off Coringah River will bear about

S.S.W. Here they may be supplied with wood, water, and provisions; and in the fair season, any repairs wanting may be effected.

Coringah Town, in lat. 16° 49′ N., is situated on the branch of Godavery River, generally called Coringah River, and bearing W. from Gordeware Point, distant 6 m. This is the best place on the coast for repairing or building small vessels, there being a considerable number of shipwrights and caulkers constantly employed building or repairing the numerous coasting traders which belong to or frequent the river or road. On the bar off the entrance of Coringah River there are from 3 to 5 ft. over a sandy bottom in common spring tides; it is H. W. at 9h. on F. and C. of moon, rise of tide from 4 to 6 ft. on the springs, and 2½ or 3 ft. on neap tides; but when storms happen, or strong gales blow from sea, the country, being low, is liable to inundations, the sea having been known to rise greatly above its ordinary level at such times. The water here, as well as in the road, is smooth, and outside the bar, the bottom being soft mud, it is common to see the country vessels aground in it. Coringah Town is situated on the S. shore, about 1 m. from the point that forms the entrance on the same side; the depths in the river, within the bar, are in general 2½ fathoms. Ingeram town is about 6 leagues up the river, from which a considerable quantity of piece-goods is exported. Contiguous to it, and on the main branch of the Godavery, stands the French settlement of Yanam.

Coconada, at which stands the pagodas of Jaggernautporam, in lat. 16° 56′ N., lon. 82° 14′ E., and about 7 m. nearly N. from Coringah, is a village with some white buildings, and two small pagodas near it. The bar of the river, which is about 1 m. to the E. of the village, has been improved by dredging and the throwing out of the two stone groynes; formerly it was scarcely navigable by boats at L. W.; inside the depths are from 8 to 12 ft.; but this river being small, it is seldom frequented, except by cargo-boats or dhonies. The anchorage in the road used to be abreast the river entrance, in 5 or 5½ fathoms, soft mud, with the village bearing W. by N., and Coringah flag-staff about S.S.W., off shore 1 or 1½ m. Ships have now to anchor about 4 m. to the N.E., and they can obtain refreshments and water at this place.

Light. Coconada Light-house, in lat. 16° 56′ N., lon. 82° 15 E., now shows a small *fixed* light, on a good stone column, as a guide to the anchorage.

Soundings. To the S.E. and S. of Point Gordeware, the bank of soundings is steep, from 45 or 50 fathoms about 4 leagues off, to 16 or 18 fathoms in a run of 3 or 4 m. towards the shore; care is therefore requisite in the night, when approaching the point from sea-ward, as depths decrease suddenly; a large ship ought not to come under 16 or 17 fathoms, and should be prepared to tack immediately after getting soundings. To the N. of the point the soundings are more regular, and do not decrease so suddenly as to the S.E. and S. Although the reefs surrounding Point Gordeware are dangerous to approach in the night or in thick weather, they may occasionally, with a gentle commanding breeze, be borrowed on in the day to 10 fathoms; but as the dry banks to the N. of the light-house are ever varying, by freshes out of the rivers, great caution is requisite in rounding these shoals. With a S. wind, bound to the anchorage in Coringah Bay, a ship,* after rounding the reef off Point Gordeware, may steer to the N. along the edge of the mud-bank in 6 or 7 fathoms until she reach the road; or in working, with the wind from W., she may borrow on the edge of it to these depths at tacking; but the soundings are not always regular.

DIRECTIONS. Bound to Coringah from the N., during the S.W. monsoon, vessels should haul in towards the coast to the S. of the Dolphin's Nose, and beat to windward close along shore. From the Dolphin's Nose, by Vizagapatam, until near Pentacotta, the coast is high, bold, and rocky, and free from all danger, but should not be approached under 12 or 14 fathoms, as those soundings are not above 1½ or 2 m. off shore. There is a high rock (Pigeon Island) close to the beach, near the village of Pudimadaka, situated 5 or 6 leagues S.W. of the Dolphin's Nose: Wattara, marked by a bungalow on the summit of a hill, bears about S.W. ½ W., 10 leagues from that promontory. Pentacotta, known by a detached conical or sugar-loaf hill, bears S.W. about 7 or 8 leagues from Wattara, and a few miles to the S. of that position the bold and rocky coast gradually terminates, and may be approached to within 8 or 9 fathoms; and when off the village of Oopauda, 20 leagues S.W. of the Dolphin's Nose, and 4 leagues N.E. of Coconada, vessels may stand in shore to 4½ and 5 fathoms, where a soft muddy bottom commences. When thus far to windward, care should be taken, by making short tacks, to hug the coast, as the freshes from the several mouths of the Godavery in June, July and August, set with such rapidity, that ships and vessels may, without precaution, experience much difficulty and delay in beating up for the anchorage. Having sighted Hope Island Light-house, by day, or the light by night, it may be brought to bear from S. ½ E. to

* A light-vessel will probably soon be moored to the N.E. of Hope Island Light-house, as the shoal-banks are rapidly advancing sea-ward in that direction, rendering the present light of little use.

S. by E., and with the Coconada Light-house bearing about S.W. to S.W. by S., ships and vessels may anchor off Coconada in 5 fathoms, soft mud, and off shore 1½ or 2 m., as the lead and light will be the only guides, and night soundings must then be carefully attended to.

Vessels from the N., bound to Coringah during the N.E. monsoon, should guard against a S. current, and make the coast between the Dolphin's Nose and Wattara, when they may direct their course for the bay; but in this monsoon large ships should anchor in 6 fathoms, with the Coconada Light-house bearing S.W., where they will find good holding-ground.

Vessels from the S., bound to Coringah in the S.W. monsoon, should in the daytime make the land about Narsapour Point, and not come under 8 or 9 fathoms. This point is low and woody, and the coast presents the same appearance until past the large fishing-village of Bendamalunka, which is 13 m. N.E. by E. from the point. Thence to the reef off Point Gordeware the coast is intersected with low shrubs and sand-hills; about half-way between the village and the reef off Point Gordeware, there is a remarkable tope of Palmyra trees. When this tope bears about S.W., the light-house on Hope Island may be seen if the weather is clear. As several ships have been lost in the vicinity of this part of the coast, and as erroneous impressions prevail respecting the soundings and extent of the bank, Captain Biden, the Master-Attendant, in the steamer *Hugh Lindsay*, hauled within 3 m. of the coast in 7 fathoms, abreast the site where the ship *Active* was wrecked, and from that position the steamer edged away S.E. for 4 or 5 m., and carried regular soundings from 7 to 19 fathoms. The same experiment was made between that position and Narsapour Point, and with a corresponding result. Having passed the tope and sighted the Hope Island Light-house, ships and vessels should keep off in 12 or 14 fathoms until the light-house bears about W. by N., when they may edge away or haul up to the N., and (attending well to the lead) bring the light to bear S.W., in not less than 9 fathoms; on which bearing of the light there is now a **Bell-buoy** placed in 5 or 6 fathoms, water, to mark the outer limit of shoal water; and about 2½ m. to N.N.W. of this, there is another, the **Middle buoy.** The **Inner buoy** is about 2 m. to N.W. of that, or about 3 m. to E.N.E. of Coconada Light-house.

With a working breeze these Coringah Banks may be approached to 8 or 9 fathoms; they are steep-to, and 6 or 7 fathoms are within the ridge of breakers, which are more or less visible according to the force and direction of the wind. Still holding on a N. course, and having brought the light-house to bear S.W., vessels may haul up for the bay to N.N.W., and gradually to N.W., after the Coconada Light is brought to the S. of a W. bearing; when it bears S.W., with soundings of 7 fathoms, soft mud, they should tack, and then prepare to anchor as previously directed.

During the night, when neither Narsapour Point nor any other shore can be seen, the coast should not be approached under 12 or 14 fathoms, and the greatest caution is at all times necessary when hauling in to make the Coringah Light. True soundings, a good look-out, and full preparation to tack or wear, or haul off shore at a moment's warning, must be attended to. Thick or hazy weather may obscure the light, and it may be prudent to stand off to the S. until daylight.

Ships and vessels from the S., bound to Coringah Bay in the N.E. monsoon, must endeavour to work up well to the N. of their port; but if they are driven to leeward, they must avoid the danger of being embayed, and should not bring Narsapour Point to bear to the E. of N., but stand to sea until they have gained sufficiently to windward of Point Gordeware, when they must attend to the sailing directions, and anchor in a windward direction, as already noticed.

The Coast above Coconada goes N.E. by N. and N.E. to Oopauda, in lat. 17° 5′ N.; then N.E. to Pentacottah; thence N.E. by E. to Wattara. From Coringah to Pentacottah it is all low, but to the N. of that place the coast becomes high, bold and rocky. Samulcottah is a military station, about 3 leagues inland to the N.W. of Coconada, and at the back of that a range of hills commences, running about parallel to the coast-line, but 12 m. from it, and approaching nearer to the sea towards Vizagapatam.

Pentacottah River, in lat. 17° 18′ N., lon. 82° 38′ E., is at the S. extreme of the Vizagapatam district; its entrance may be known by two sand-hills and a cocoa-nut grove near the beach. Toonee conical hill is about 7 m. inland of Pentacottah. **Wattara,** a small town in lat. 17° 26′ N., lon. 82° 52′ E. (variously called, Ratadah, Vatarda, and Wattraw), bears from Point Gordeware N.E. by N., and from Coconada nearly N.E., distant 15½ leagues: the coast between them may be approached with safety to 12 or 14 fathoms about 2 or 3 m. off shore, being bold and clear of dangers; the edge of soundings is seldom distant above 4 leagues from the shore. The low coast of Golconda terminates about 6 leagues to the N. of Jaggernautporam, where a ridge of hills or high land begins, stretching from thence along near the sea to Ganjam. Three leagues about E.N.E. from Wattara is the **Pillar Rock,** about ¾ m. off shore, in lat. 17° 30′ N., lon. 83° 0′ E. **Pigeon Island,** in lat. 17° 38′ N., lon. 83° 13′ E., is about 15 m. from Pillar Rock, and the village of Pudi, or Pudi madaka, lies between them.

COAST OF ORISSA

The Coast of Orissa, or Orixa, is said to commence to the S. of Wattara, extending from thence to the entrance of the River Hoogly; but the S. part of this coast was generally called the Northern Circars, and the name Orissa used for that part farther to the N.

VIZAGAPATAM, in lat 17° 42′ N., lon. 83° 17′ E., is distant 10 leagues N.E. by E. from Wattara: the coast between them is a little convex, with middling high land near the sea, bold and safe to approach to 14 or 15 fathoms, within 2 or 3 m. of the shore. Vizagapatam may be known by the bluff headland, called the Dolphin's Nose, which forms the S.W. point of the road, but it is obscured *under* the high land, when viewed from the offing. About 5 m. to the S.W. is Pigeon Island, almost close to the shore, appearing like a small hummock, and not discernible until near it; the coast opposite this island is sandy and barren. When Pigeon Island bears about N., and 5 or 6 m. off, the Dolphin's Nose may be plainly seen, and other hills around Vizagapatam; one of these to the N. of the Road is called the Sugar-Loaf, but the highest is several leagues inland from the town. **Waltair,** known by its bungalows, on a cliff or rising ground, where most of the Europeans reside, is 3 m. to N. of Vizagapatam, and has been often mistaken for that place by strangers; vessels have sometimes anchored abreast it till informed of the mistake.

Anchorage. In the S.W. monsoon, the best berth for small vessels is close under the N.E. side of the Dolphin's Nose, in 6 fathoms, sandy bottom; it being steep-to. Large vessels, in the same season, may anchor in 8 or 9 fathoms, mud and sand, with the Green Hill (to the S. of Dolphin's Nose) bearing S.W., the Bar Battery, N.W. by W., and the Sugar-Loaf in one with Waltair House.

In the N.E. monsoon, it is prudent to anchor farther to the N.E., in the same depths, with Waltair House on with the W. side of the Sugar-Loaf, and the top of Green Hill just open with the Dolphin's Nose; the fort flag-staff will then be nearly in one with the centre of Middle Battery, and the mouth of the river open, where a ship will be in 8 fathoms, sand and mud, off shore 1½ or 1¾ m: this is a good berth, and ships ought not to anchor farther to the N. By anchoring farther out, in 11 or 12 fathoms, they are in danger of losing their anchors, the bottom being very stiff mud. On the bar at the entrance of the river there is from 8 to 10 ft. water, and sometimes more in the N.E. monsoon; but the sands are liable to shift, with a decrease of depth in the opposite monsoon. As the water shoals fast in standing into the road, sail should be reduced in time, before a ship is too near the shore. Abreast the Dolphin's Nose, at 2 or 2½ m. distance, the depths are 20 and 21 fathoms, with it bearing about N.W.; and the shore continues equally steep from thence towards Pigeon Island: the bank of soundings hereabout extends 3½ or 4 leagues from the land.

BIMLIPATAM, in lat. 17° 53′ N., lon. 83° 27′ E., bears N.E. about 5 leagues from Vizagapatam: the coast between them is bold, having 15 and 16 fathoms, water, within 2 or 3 m. of the shore. A hill projects in a headland on the S. side of the river, and all the land near this place is high. Ships may anchor in from 6 to 8 or 9 fathoms, abreast the river and village, in the S.W. monsoon; and a little farther to the N. in the other monsoon. From Bimlipatam the coast trends N.E. 8 or 9 m. (with some red cliffs half-way) to **Konadah** or Conara River, and about 1½ m. to S of the river is Konadah Point. Santapilly, or Chintapilly Village, is 3 or 4 m. to E.N.E. of Konadah. Nearly opposite this point lies a dangerous ledge of rocks under water, not easily discerned, distant 6 m. from the shore, called **Conara, or Santipilly Rocks:** close to them on the outside the depths are 16 and 17 fathoms; and a ship ought not to come under 17 or 18 fathoms in passing on that side.*

Light. A light-house on the roof of a house, showing a *fixed* light, 150 ft. above the sea, is placed on Konadah, or Conada Hill, ¾ m. inland, in lat. 18° 3½′ N., lon. 83° 36½′ E., and in clear weather may be seen 4½ leagues; it bears from the rocks N.W. by W. ½ W.

SANTIPILLY ROCKS, about 16 m. to N.E. by E. of Bimlipatam, are in lat. 18° N., lon. 83° 43′ E., and distant from the coast 6 m. They are about 10 ft. under water, steep on all sides, and their extent is not beyond 200 yards. When there is little wind and a smooth sea, the shoal presents no indication of broken or discoloured water, as Lieutenant Fell, when in search of it during very fine weather, anchored the surveying brig *Kristna* within 100 yards of it without observing the slightest appearance of the shoal. He then proceeded in the vessel's boats over the rocks, and found 10 ft. on the shoalest part; on the E. side 7 and 10 fathoms, and at its W. limit 10½ fathoms, rocky bottom. Captain Biden, the late Master-Attendant, surveyed the rocks in the

* The Santipilly Rocks, being 6 m. off shore, the careful navigator must see the importance of keeping the lead going, rather than trusting to sight the light, which in hazy weather might be obscured.

steam-vessel *Hugh Lindsay*, during fine weather; and with a moderate breeze from S.W., and a ground-swell, the breakers were clearly discerned from the mast-head at 6 or 7 m., bearing due S., and Santipilly Peak bearing W. by N., in 7 fathoms, water, off shore about 2 m; the breakers were soon after seen from the deck. The shoal is said to lie N.N.W. and S.S.E., in circumference about ¼ m., with 10 fathoms all round very close to the rocks.

The inner channel is safe for ships and vessels of every class, having 5 fathoms within 1 m. of the coast, and 9 fathoms within ¼ m. of the rocks; thus affording a clear channel of nearly 4 m. in breadth. When the Peak of Santipilly is visible, it affords an infallible guide to the position of these rocks, for it is a very remarkable land-mark; and, being at least 2,000 ft. above the sea, presents a striking contrast to all the hills in its vicinity. It bears N.W. ½ W. from the rocks, and the base of the mountain is not more than 7 or 8 m. from the coast. The *Great* and *Little* hills of Conada, close to the beach, may be seen by day, when Santapilly Peak may be obscured. The light-house is on the N.-most or Little hill, which is about ½ m. from the beach. But in thick weather, when no well-defined land-mark is discernible, then it becomes absolutely necessary to approach the coast between Ganjam and Vizagapatam with great care and caution, as change of current may, without strict attention to soundings, place a vessel in imminent peril close to, or upon the Santipilly Rocks, which should not be approached from the E. by night or by day under 17 fathoms.

The COAST of GANJAM DISTRICT commences at the Chicacole River, and goes up to the Chilka Lake. Chicacole is its chief town, having superseded Ganjam town in 1815.

Chicacole River, or the Naugulu, bears from Conada Light N.E. by E., distant 6 leagues: the coast between them is high, and may be approached to 10 or 11 fathoms, about 2 or 3 m. off shore. The town of Chicacole, formerly noted for its muslins, is 4 m. from the sea on the N. bank of the river. Its port, formerly known as **Mafooz Bunder,** is now only a petty village, as the river entrance is so choked up.

Calingapatam River, 4½ leagues to the E.N.E. of Chicacole, is on the N. side of Sandy Point, in lat. 18° 19′ N., lon. 84° 7½′ E. It may be known by Garah Hill, about 4 m. inland, having a white pagoda on its side; but as it is sometimes obscured in hazy weather, a beacon has been erected on the point, which is long, low, and sandy, and has a reef of rocks extending from it about ½ m. to sea-ward. In passing this point vessels ought not to approach nearer than 8 fathoms. **The beacon** is an obelisk of cut stone, with a cap standing on a pediment, 64 ft. in height. The town is on the S. bank of the river, between it and the beacon. The exports are chiefly rice, wheat, ginjely-seed, gram (Indian pea), hides, timber, and bees' wax. The best anchorage is in 6½ to 7½ fathoms, with Sandy Point S.W. by S., 2 to 3 m. off; and the highest upper-roomed house near the shore W.N.W. to N.W. by W., about 1½ to 2 m. off shore.

Nowpada, or Bapanapaudoo, in lat. 18° 34′ N., lon. 84° 19′ E., lies 20 m. to the N.E. of Calingapatam; a black and white column, about 50 ft. high, on the beach, distinguishes this place from others to the N. **Poondy, or Pudi,** in lat. 18° 40′ N., at the mouth of a small river, has a white obelisk near the travellers' bungalow, and a flag-staff, all three conspicuous objects. The river Pondy, or Poondy, has several rocks projecting from it to sea-ward. Over this place, at some distance in the country, the High Land of Pondy is high and uneven; along the coast it becomes of middling height, but equally uneven. Barwah, or Barva River, is to the N.E. of Pondy, having several hills contiguous, which are not very remarkable.

Barwah, in lat. 18° 52′ N., lon. 84° 36′ E., about 17 m. to N.E. of Poondy, may be distinguished by two black and white columns, about 50 ft. high, and the anchorage is abreast of them. To the S.W. of Barwah there are cocoa-nut trees, but only sandy shore to the N.E. **Sonapur,** or Soonapoorpettah, in lat. 19° 6′ N., and about 20 m. from Barwah, has a white obelisk and a white column, each about 50 ft. high; and also a flag-staff and custom-house; abreast of which vessels may anchor.

MONSOORCOTTAH, or GOPAULPORE, in lat. 19° 15′ N., lon. 84° 54′ E., is 4 leagues to N.E. of Sonapur. Carapar, an oblong hill, is near it, and 3 leagues from Ganjam. A little to the S.W. of Carapar Hill, upon a woody and level piece of land, stands Monsoorcottah Pagoda, and the river of Carapar, or Monsoorcottah, is about 4 leagues to the S.W. of Ganjam, having a small fort at its entrance. When a scarcity prevails on the coast, ships carry rice from Bengal to this place. Some moorings are now laid down for large vessels; an aggregate of 60,000 tons of shipping now annually visit this place. There is a large, white building on the beach, a godown for the Aska sugar, which is exported from this place. The custom-house is to the S. of the godown.

Light. At Gopaulpore there is now a *fixed* light, elevated 90 ft., and visible 8 m.; it is not far from the custom-house. The anchorage is with the light bearing N.W. by W. to W.N.W., and Saddle Hill about W.S.W., off shore about 1½ m., in 9½ fathoms. In this depth the bottom is stiff mud, with little sand; but nearer the shore it is sandy, and not such good holding-ground.

GANJAM (the flag-staff), in lat. 19° 22′ N. lon. 85° 3′ E., bears from Calingapatam River nearly N.E. by N., distant 27 leagues: the coast between them is high, and may be approached in general to 12 or 14 fathoms, about a league from shore. This place, which is 12 m. to N.E. of Monsoorcottah, was formerly the capital of the Ganjam district; but, since 1815, it has been superseded by Chicacole. The town stands on an elevated portion of the plain, with a range of mountains in the back-ground, but the country to the N. is low, and often flooded. At Ganjam a considerable trade is carried on, particularly by coasting vessels, many of which can enter the river, it being of considerable size. Ships may anchor in the road, abreast the fort or river entrance, in 8 or 9 fathoms, about 2 m. off shore. The bottom along this part of the coast is sometimes coarse sand and gravel, affording indifferent anchorage; and under 20 fathoms, about 3 or 4 m. from shore, the depths decrease suddenly in standing towards it. From Vizagapatam the bank of soundings lining the coast has generally from 40 to 45 fathoms on the edge of it, about 4 or 5 leagues off shore, then a sudden declivity to no ground: from 20 to 30 fathoms are good depths to preserve in coasting along with a fair wind.

COAST OF THE BENGAL PRESIDENCY.

Manikpatam, in lat. 19° 45′ N., bears about N.E. by E. from Ganjam, distant 14 leagues. The chain of mountains extending along the coast terminates in several saddle-hills to the N. of the latter place, leaving between them and the shore a low, level plain of reddish soil, where it fronts the sea. Ships, in coasting along, may approach the shore occasionally to 10 or 12 fathoms, but it is preferable to keep in from 16 to 20 fathoms. Manikpatam is situated at the entrance of an inlet or small river, leading to the Great Chilka Lake, which is said to extend 10½ leagues along the coast: it may be known by a small pagoda encompassed with other buildings, having near them some trees. From this place a sand bank is said to project 2 m., on which the water shoals suddenly from 10 to 4 fathoms; a ship, ought, therefore, to avoid it in passing, by not coming under 11 or 12 fathoms. From Manikpatam to the Jaggernaut Pagodas the coast extends about E.N.E. 3 leagues; but the pagodas, being a little inland, bear from the former place nearly N.E. by E. ½ E. Between them the coast is low, with a sandy beach, and may be approached occasionally to 10 or 11 fathoms, about 2 or 2½ m. off shore.

The JAGGERNAUT, or POOREE PAGODAS, the largest being in lat. 19° 48′ N., lon. 85° 48′ E.; are three large circular buildings, surrounded by several smaller ones; they are of conical form, decreasing in diameter from their bases to their summits, which are crowned with white domes, and an ornamental globe or urn and wind-vane. The W. pagoda is the largest, and the E. one the smallest of the three. They are all nearly in one, bearing W. by N.; when brought to bear N.W., they begin to appear separated; when N.N.W., they are perceived to be distinct buildings, though when seen far off they seem connected. They are situated upon low land, well clothed with shrubs and small trees; and many other white buildings stand near them, of diminutive size in comparison with the largest pagoda.

Black Pagoda, in lat. 19° 52′ N., lon. 86° 6′ E., stands also at a small distance from the sea, and bears from the Jaggernaut Pagodas about E. by N. ½ N., distant 16 m. The coast between them is rather low, having a level and barren aspect, with a steep sandy beach, and may be approached to 10 or 12 fathoms; these depths being from 1½ to 3 m. off shore; but the soundings are not always regular. From 15 to 18 fathoms are good depths to preserve in coasting, about 4 or 5 m. off shore; but caution is requisite in the night, as *then* the low coast is seldom seen, and if the lead be neglected, or *over hove*, a ship's proximity to the shore may be first discovered by the noise of surf on the beach, when the wind comes off the land.

When the Black Pagoda bears N.N.E., it appears like a high rock, rising abruptly at its E. end, in shape of the gable end of a house, and a high pinnacle like a chimney projects upwards from its W. end, from whence it gradually slopes down to the surface of the low land. There are three little clumps of trees or hummocks to the N.E. of it, and one to the S.W., which show their tops just above the white sand-hills that form the sea-coast. This pagoda being situated on even, low reddish land, destitute of trees, and being smaller and blacker than Jaggernaut Pagodas, may be easily distinguished from the latter; in some views the Black Pagoda appears like a huge rock. From the Black Pagoda, the distance to the False Point is 16 leagues, and the course nearly N.E. by E.; but from this pagoda the coast extends 5½ leagues about E.N.E. to the Davy branch of the river Mahanuddy, called also Cuttack River, from the large town of this name, situated on it at a considerable distance in the country.

Davy River mouth, about lat. 19° 57′ N., lon. 86° 1′ E., passing through the Hurrickpoor sub-division of Cuttack district, has of late years been surveyed and frequented by native vessels

carrying rice to the famine-stricken interior. On this branch of the river, a flat of hard ground projects to sea-ward, on which the depth will decrease a little if a ship pass over the tail of it, but there is no danger if she keep 2 or 3 m. off shore, in from 12 to 14 fathoms; and in daylight it may, in fine weather, occasionally be approached to 10 fathoms. Near this place other small branches of the Mahanuddy fall into the sea, forming low islets, and this elbow, or projecting part of the coast, called **Cojung Point,** has sometimes been mistaken for the False Point, as the shore from it takes a N. direction 2½ or 3 m., forming a *small* concavity in the land, called Cojung Bay, nearly mid-way between the Black Pagoda and False Point. The whole of the coast is low to the N.E. part of this small bay, and from thence it stretches N.E. ½ E. and N.E. about 5 leagues to the False Point, very low land. From Cojung Point to False Point, the distance is about 6 leagues. The coast in this space may be approached to 10 or 11 fathoms in fine weather, or occasionally, when working in the day-time, or with the wind from the land, a ship may stand at times into 8 or 9 fathoms, about 2 m. from the shore, the soundings being most regular. Ships passing from the Black Pagoda to the False Point generally keep in 14 and 15 fathoms, which is preferable to borrowing nearer the land; particularly with unsettled weather in the night, or with the wind from sea-ward, it is prudent not to come under 13 or 14 fathoms. Between the Black Pagoda and False Point there are 40 and 45 fathoms on the edge of the bank of soundings, about 5 or 6 leagues off shore: near the point, soundings extend farther out.

FALSE POINT, in lat. 20° 22′ N, lon. 86° 49′ E., is low and woody, fronted by a long and extremely narrow island, called Dowdeswell Island, which extends from about a mile S. of the light-house to about 5 m. N.E. of it, forming to the N. of the Point a bay, in the centre of which is a small island, called Plowden Island. The bay, called **False Bay,** is very shallow, having not more than from 2 to 6 ft. in it, except in the channels leading from the Mahanuddy River; one of which has lately been surveyed, and found to have capacity to admit vessels drawing 12 ft. water.

Light. The Light-house stands about 2 m. S.W. of the Point, in lat. 20° 20½′ N., lon. 86° 47′ E. The building is coloured red or reddish brown, with a large *white* star in the centre, and exhibits a *fixed* light 120 ft. above H. W. The light may be seen 18 m. from a vessel's deck if elevated 15 ft. above the sea. Vessels are recommended not to come under 8 fathoms, for the purpose of *making* the Light-house or Light, and having sighted it, to deepen their water again from 13 to 18 fathoms, according to circumstances, on steering to the N.E. for the purpose of getting a pilot.*

PORT OF CUTTACK. To the N. of the False Point Island and bank is False Bay, which has all over it a soft bottom of green mud, with regular depths decreasing gradually to the shore; but at the N. part the quality of the ground changes from soft mud to a mixture of sand and mud, with rotten stones and broken shells, on the S. edge of the extensive sand-banks and reefs environing Point Palmiras. A little to the N. of False Point, two branches of the river Mahanuddy fall into the sea, and farther to the N. are two sand-hills: all the coast but these is low and woody. Subsequently to the Orissa famine of 1867, this bay to the N. of False Point was surveyed, and ships have taken cargoes of rice there from Chittagong and other ports. Beacons and buoys have been laid down, and thus False Bay has been constituted the Port of Cuttack.

POINT PALMIRAS (called by the natives **Mypurra,** from the contiguous sandy island of this name), in lat. 20° 44′ N., lon. 87° 1′ E., bears from the False Point about N.E. by N., distant 8½ leagues; but from being abreast the latter in 14 or 15 fathoms, with it bearing W.N.W., the direct course is about N.E., and the distance 10 leagues to the outer edge of the bank off Point Palmiras in the same depth, with the Point bearing W.N.W. Ships must be guided by the soundings in passing between them, as the flood sets *towards*, and the ebb *from* the shore: from 14 to 15 fathoms are good depths to preserve with a fair wind. The land of Point Palmiras is low, and clothed with Palmyra trees, having on each side of it, at a small distance, the mouth of a river: that on the S. side is navigable by boats or small vessels. In rounding the bank off the Point, the trees on the land are just discernible (from aloft) in 15 fathoms, water, distant about 5 or 6 leagues from the shore; ships, therefore, seldom see the Point in passing, unless the weather be clear, and the reef approached under 14 or 15 fathoms, which ought never to be done in a large ship during thick weather, or in the night.

Palmyras Reefs. Shoal banks extend off Point Palmiras to the distance of about 12 m., having channels between them leading to the entrances of the rivers near the Point. What was formerly called Mypurra Island is a mere sand-bank. The banks have on them from 1 to 5 fathoms, the water deepening rather suddenly to the E. of them from 4 to 10 and 14 fathoms: to the N. and S. the decrease is more gradual. The S. part of these banks is more flat than any other part of

* Directions for proceeding to the pilot station will be found in the subsequent chapter.

their exterior limit; for here the depths gradually decrease, and their boundary on this side can only be known by the change of ground, from soft mud in False Bay, to a mixture of coarse sand and mud, with rotten stones and broken shells upon the edge of the banks.

A ship passing False Bay in daylight, with a W. wind, may steer along at discretion in 10 or 12 fathoms: but if she get into 9 fathoms and see Point Palmiras, she ought instantly to haul out into 12 or 14 fathoms in rounding the E. limit of the bank. When blowing strong from S.W. or S., a ship with daylight, after rounding the banks off Point Palmiras, may haul to the W. and anchor to the N. of the banks in 10 fathoms, or rather less water, where she will be sheltered by them until the force of the winds is abated. The light-house, which was formerly a guide to vessels rounding the banks off Point Palmiras, has long since been undermined by the sea. Therefore, in the absence of land-marks, **the lead** must be the guide to all vessels along the bank of soundings off Point Palmyras, called the Pilot's Ridge.

Kannika, or Kunka River, to the N. of Point Palmyras, is about a mile wide at the entrance, having a channel of approach to it between the sand-banks of 7 m. length, in which the depths vary from 1½ to 3 fathoms. The entrance of this channel is indicated by a buoy on its N. side, which lies in about 4 fathoms, at the distance of 6 m. from the nearest shore. The depths within the entrance of the river are 2 and 3 fathoms, and it appears that, with a pilot, vessels drawing under 12 or 13 ft. may sail into the river at H. W. Kunka River is much frequented by small vessels navigated by natives, who trade from hence to Calcutta, Chittagong, Madras, and places on the Coromandel coast, during the favourable monsoon. Trading boats from the Maldive Islands also make their appearance here once in the year, as at Coringah and Ballasore. Dhumrah River, to N. of the Kunka, and dividing Cuttack from Ballasore, admits vessels drawing 12 or 13 ft.. and is visited by native craft for rice and grain.

Tides. At Point Palmiras, and the entrance of Kannika River, it is H. W. about 9 or 9½ h. on F. and C. of moon; the rise of tide 10 or 12 ft. on the springs, and 7 or 8 ft. on the neaps.

Churinga, or Churrimoon Creek, bears from the entrance of Kannika River nearly N.N.W., distant about 7 leagues: the coast between them is low, and to the N. of Kannika River a flat, dry in some places at L. W., extends about 4 m. from the shore; the depths towards the outer edge of it decreasing gradually to 2 fathoms. The Bay of Churinga, called also Kannika Bay, affords good anchorage in the S.W. monsoon, to the N.W. of Kannika Flat; but the shore is fronted by shoal water, there not being more than 3 fathoms at the distance of a league from it, and being out of the track of ships bound into Hoogly River, the anchorage under the island off Point Palmiras is preferable. At Churinga Creek the coast forms a curve, taking a direction from thence nearly N.N.E., and N.E. by N. about 8 leagues to Bulramgurry, at the entrance of Ballasore River: between them there are other small rivers or creeks, and all the coast is low, with a flat stretching along it, on which the depths are not more than 2½ or 3 fathoms nearly 2 leagues from the land: and in some places the banks are dry at L. W. a mile from the shore.

BALLASORE RIVER, the entrance, is in lat. 21° 28′ N., lon. 87° 3′ E. From the Point, all the low coast is planted with trees until within 2 or 3 m. of the entrance of this River, which on both sides is destitute of them, having a sandy barren aspect; by this it may be known, particularly by the small sand-hills on the N.E. side. When the Nilgurh Hills, situated inland to the W., are seen, they answer as a good mark for a ship having occasion to proceed to the anchorage. With the extremity of the S. or Long Hill W. ½ S., the peak of the middle one appearing highest and separated from the others W.N.W., or W. by N. ¾ N., the smallest to the N.E. bearing N.W. by N. ¾ N., the smallest to the N.E., bearing N.W. by N., a ship will have a good berth in 5 fathoms, mud, with the entrance of the river about N. by W. off shore nearly 10 m. The bank here is very flat, the depths being 2½ and 3 fathoms about 4 or 5 m. from the land. From the anchorage in 5 fathoms the peak of the Nilgurh Hills bears W.N.W., distant 20 m.; and from Balramgurry, at the river's entrance, it bears W. ½ N., distant 14 m.

A boat proceeding for Ballasore River should carry a compass, and in crossing the bar, ought to bring the flag-staff at Bulramgurry or the Banks-hall House, N.N.W.; keeping it on this bearing will lead her to the outer beacons, which are poles placed on each side of the bar. From hence, the channel lies directly towards the S.W. point of the River, where the passage is marked out by beacons or poles on each side, placed at convenient distances on the shoals. At F. and C. of moon, it is H. W. about 10 o'clock, and the tide rises from 12 to 15 ft. in common springs; but there is not more than 2 or 3 ft. on the bar at L. W. in the dry season; it is therefore proper not to attempt to pass over until the last quarter-flood, for the sea breaks high upon it during the first quarter-flood, particularly in the S.W. monsoon. The chart shows a buoy off the entrance, which bears S.E. 3½ m. from the flag-staff.

Peply, or Soobunreeka River, in lat. 21° 34′ N., bears E.N.E. from the entrance of Ballasore

River, distant 5 leagues; it is known by a pagoda on the W. side of the creek, having near it a tope of trees. Small vessels passing between these places may steer along the coast in 4 fathoms, about 5 m. from the shore, and when the pagoda bears N., they may haul in near the entrance of the creek, where there are 2 fathoms at L.W. between it and the sand. Peply, having been superseded by Ballasore, is now an insignificant place; but the river runs up to Jellasore, a large town, about 20 m. farther up. Peply Sand stretches S. 5 m. from the creek, having 3 fathoms on its outer part, but is nearly dry at L.W. about 2 m. off the land. A ship intending to anchor in Peply Road, to the E. of the sand, ought to steer round its S. end in 8 or 9 fathoms, and when the pagoda is brought to bear N.N.W. she may begin to haul up to the N.E., on the E. side of the sand, and anchor with the pagoda bearing N.W. by N., in 5 fathoms, water. From Peply River to Ingellee, or Hidjlee, in lat. 21° 46′ N., the direction of the coast is first E. by N. ½ N., and then about N.E. by E.: the whole of it is low, and interspersed with sand-hills. The small trading vessels from Ballasore keep close along the coast between Peply and Ingellee, in a little channel, with 2 or 3 fathoms in it at L.W., formed between the sands and the shore.

Ballasore Road, which is the name generally given to the extensive bay formed between Point Palmiras and the banks at the entrance of the river Hoogly, affords good anchorage, the bottom being mostly stiff blue clay, intermixed with sand at times, or small stones. During unsettled weather in the S.W. monsoon, it may frequently happen that a ship cannot round the reef off Point Palmiras so near as intended, to enable her to anchor on the N. side of it in smooth water; in such case she ought, when round the reef, to haul to the N.W. into 14 or 15 fathoms, and anchor. Here ships ride easier and more safe than farther to the E.; being in deep water, the sea runs fair, whereas it runs high and short about the sea-reefs, and in the channels between them, with stronger tides than in the road.

THE PILOT'S RIDGE is an extensive bank of soundings, stretching from the Cuttack coast towards the Pilot Station at the entrance of the Hoogly. For many years there has been placed here a **light-vessel** (*see* page 476), similar to that of the E. channel, which shows a *fixed* light, on the N.E. part of the Pilot's Ridge Bank, moored in 21½ fathoms, in lat. 20° 50′ N., lon. 87° 41′ E., distant 21 leagues N.E. by E. from False Point Light-house, from the 15th March to the 15th Sept. She burns a blue light every hour, and a maroon at the intermediate half-hours; a buoy is placed a little to the N. of the Ridge light-vessel.

A vessel, therefore, after making the light-house on False Point (in passing which she ought not to go into less than 12 fathoms), should bring it to bear about W.S.W. 10 or 15 m. distant, when she will be in 11 or 12 fathoms; and then steer E.N.E., when the soundings will gradually increase to 23 fathoms on the E. edge of the Pilot's Ridge. She should then regulate her course so as to keep between the ridge and the depth of 27 fathoms; when, by attention to the lead and to the nature of the soundings, as well as to the course and distance run, it will be almost impossible to miss the light-vessel, which, during the S.W. monsoon, is stationed close to the S. of the buoy on the ridge. The soundings to sea-ward of the ridge, are, in general a greenish or olive-coloured mud, with occasionally a few bits of broken shells mixed with it; while those on the ridge are of a shelly sand, or minute gravel, of a reddish, or rusty-brown colour. Vessels approaching the station are warned to be careful in avoiding collision, when either communicating with the light-vessel, or the supplying Pilot-vessel: and on making the former at night, they are recommended to heave-to, at a proper distance, till daylight, by which they will avoid the probability of passing the supplying Pilot-vessel in the darkness of night. (*See* Recent Notes, page 474.)

APPROACHING CALCUTTA SAND-HEADS from MADRAS COAST. When the S. winds begin to have strength during the latter part of March, or early in April, the weather is generally hazy, preventing the land from being discerned, unless it is very near; nor can observations be always obtained. It is therefore proper for ships bound to the Hoogly River in the strength of the S.W. monsoon, to fall in with the coast of Orissa to the S. about Pondy, or between it and Ganjam, where the land is of considerable height. They ought certainly not to exceed the latitude of Jaggernaut Pagodas, in lat. 19° 47′ N., before getting in with the coast. These will be discerned from 17 or 18 fathoms, although the weather is hazy, but with a commanding breeze in daylight, the coast hereabout may be approached with safety to 12 or 13 fathoms, about 3 or 4 m. from the shore. As the land is low and sandy close to the sea, it will not be seen in the night, unless a ship is very near; and in hazy weather, the noise of the surf on the beach would probably be the first indication of danger; it is therefore prudent, in the night, not to come under 15 fathoms, nor to deepen above 17 or 18 fathoms, which depths may be preserved by attending to the lead and running under easy sail. The Davy, or Debni River Mouth, is about 5 leagues to E.N.E. of the Black Pagoda. Being 3 or 4 leagues past the Black Pagoda, a direct course about N.E. E.

should be followed, to obtain the proper soundings off False Point, taking care not to haul into Cojung Bight or Bay, about half-way between them. The depths decrease gradually towards the bank surrounding False Point. When abreast of that point, in 14 or 15 fathoms, the bottom in some places is coarse brown sand and shells, with black specks; in other places, mud and sand; but to the N. of this point, all over False Bay, the bottom is very soft, green mud.

With False Point Light-house bearing W.N.W., in 14 or 15 fathoms, the course is N.E. 10 leagues, to clear the bank off Point Palmiras; but as the tides affect a ship laterally, she ought to keep in 14 or 15 fathoms with a commanding breeze, or in 16 fathoms if the wind is S.E. For rounding both False and Palmiras Points, 15 fathoms is a good track, also in crossing the bay between them; this depth is far from danger off the former, and also when Point Palmiras bears well to the N.; but when this point is bearing to the S. of W., the 15 fathoms track is not far from the edge of Palmiras Reef; for here the water shoals suddenly from 10 to 7 fathoms, then to 3 fathoms in some places. It may be observed, that the water will not deepen in steering N.E., from having 15 fathoms off the False Point; but in steering the same course from having 15 fathoms on the edge of the bank off Point Palmiras, the water will deepen gradually to 17 and 18 fathoms; she ought then to haul to the N.N.W. or N.W., until she get into 16 or 15 fathoms, in which depths the pilot-vessels used generally to anchor at night during the S.W. monsoon, in Ballasore Road. If blowing strong at S.W. in rounding Palmiras Reef in daylight, a ship may steer along the edge of it in 12 or 14 fathoms, taking care not to approach the N.E. part under 12 or 13 fathoms, where it is dangerous and steep under 10 or 11 fathoms. When round that part, she may haul to the N.W., and anchor to the N. of the Mypurra Sand, where she will be sheltered from the sea by the reef. If a ship haul up too soon for Ballasore Road, the water will shoal suddenly on the N.E. edge of the reef, over a sandy bottom; she ought in such case to edge out immediately into 15 or 16 fathoms, the bottom then in the fair track will soon change to stiff, blue clay, mixed with sand and stones, or at times with shells; and this is in general the quality of the ground to the N. of Point Palmiras, in the Bay of Ballasore.

The difficulty of rounding Palmiras Reef necessitated the removal of the Pilot Station from off Point Palmiras to a position about 15 m. W.S.W. of the outer Floating Light. The New Pilot Station between the South Channel Buoy and the Pilot's Ridge, adopted for the past thirty years, can be made by vessels from False Point with great facility, and pilots can also be readily supplied there. Therefore this latter station has been continued during the S.W. monsoon; viz., from March 15th to Sept. 15th. No difficulty can possibly be felt in passing from False Point to the present station, if common attention be paid to the lead and to the directions, prepared by Captain Lloyd, the last Marine Surveyor-General.

The South Channel Buoy, in lat. 20° 59′ N., and lon. 88° 4′ E., bears from False Point Light-house about N.E. by E. by compass, distant 83 m., and is laid in 12 fathoms. A bank of soundings extends from off Point Palmiras in a direction towards the tail of the W. Sea Reef, and the nature of the bottom (as distinguished from that of the Hoogly Deposit, which is sand and mud, with shining specks) is a gravelly substance composed of sand, shells, and small pebbles, discharged from the Kunka and other rivers near Point Palmiras, the lighter material of which being carried farther out, is deposited, and forms what is called the **Pilot's Ridge,** which, in crossing to the N.W., shows a little less water than on either side. In coming from sea-ward, you shoal rather suddenly from 28 to 23 fathoms, upon its E. edge. It is composed of a shelly sand, or minute gravel, of a reddish or rusty-brown colour.

Caution to Strangers.—Vessels approaching the station, where the supplying pilot brigs are found, during the day are required to show the usual signal for a pilot, and by night to give as early and as much warning as possible by firing guns, burning blue lights, and by exhibiting two lights in a vertical position, where best seen; but commanders are strictly enjoined to avoid as much as possible making the station during the night. **Ships have been lost** from running for the Pilot Station in dark, or threatening, or actually bad weather. In such weather, the pilot-vessels cannot be made out: and if fallen in with, cannot board the inward-bound vessel, and perhaps the pilot could not take her in, if he was on board. No advantage, then, is gained by attempting to get a pilot in such weather, while the danger is imminent. It is strongly recommended, therefore, to commanders, under such circumstances, to put their ships under snug canvas while well out in deep water, and keep to sea. (*See* the foot-note at page 658.)

If unable to keep out to sea, owing to a strong flood tide and a Southerly gale, and when unable to get a pilot, a commander must use his discretion about running on to pick up the Outer floating light and the *two* Gaspar light-ships. With the latest Admiralty charts on board, a commander ought to have no more difficulty in running up to Saugor Roads than is experienced by vessels making Bombay Harbour in the S.W. monsoon.

Pilot's Ridge Light-vessel. To mark the station, in lat. 20° 50′ N., lon. 87° 41′ E., during the S.W. monsoon—March 15th to Sept. 15th—a regular Light-vessel is now placed there. She shows a *fixed* light at the main-mast head, visible in clear weather 10 to 11 m.; and will burn a blue light and a maroon alternately every half hour. (*See* also page 474.) The light-vessels are directed, when a vessel is approaching during the night, to show a light at the gaff end, to mark the way they are riding.

Vessels approaching the station, and while there, as well as when approaching the light and buoy station-vessels, are warned to be careful in avoiding collision by night or by day; and in communicating with either of the above vessels, either at anchor or hove-to, when it is necessary to cross her, to pass under the stern; several instances of serious damage having occurred during the S.W. monsoon, whereby the outer floating light was more than once compelled to leave her station for repairs, to the great inconvenience and risk of vessels entering and quitting the river.

The pilot-vessels are now brig-rigged, and excellent sea-boats, of from 250 to 350 tons. If spoken with by any ship (if it is not their *turn* to take charge) they will direct her where to find the pilot, whose vessel will show a small *red* flag at the gaff end. At *present*, pilot-vessels in the N.E. monsoon are found at the entrance of the Eastern Channel, and they generally anchor on the E. Sea Reef at night, or during the flood in the day. At times a pilot-vessel may be found to the E. of Saugor Sand, or to the W. of the W. Sea Reef, on the look-out for ships that have deviated from the common route; but *now* they are generally found at the tails of the reefs. If a ship get accidentally on the tail of any of the sea reefs, she ought not to stand into shoal water, for the sea runs high upon them in the S.W. monsoon; it will be prudent to tack or haul off immediately into deep water, or anchor until the ebb-tide enables her to work to the S. clear of them.

In Sept., when the strength of the monsoon is abated, it is not considered dangerous to stand to the E. in 12 or 11 fathoms, near the tails of the sea reefs, particularly in favourable weather; by doing so pilots may at times be found, bringing out ships by the Eastern Channel; but it is only when no pilots are found in the road, and the weather settled, that a ship may venture to stand near the tails of the sea reefs in search of one, and it ought not to be done in the months when the S.W. monsoon generally blows strong.

Eastern Channel. Since the Western Channel has become dangerous for large ships, by a decrease in the depth of water, and the Eastern Channel now adopted, the pilots, to enter the latter, in conducting ships from Ballasore Road in the S.W. monsoon, steer to the E., crossing over the tails of the W. and E. Sea Reefs, the soundings obtained on these being their principal guide. The judicious navigator, with the chart before him, and attention to the directions, may proceed with confidence in case of necessity. (*See* Recent Notes, page 474.)

TIDES OF THE RIVER HOOGLY.

Tides. In the Eastern channel the tides set as follows, when uninfluenced by the wind:—

1st Quarter Flood, N.W. by W.; 2nd Quarter, N.N.W.; 3rd Quarter, N.N.E.; last Quarter, E.N.E.

1st Quarter Ebb, S.E. by E.; 2nd Quarter Ebb, S.S.E.; 3rd Quarter, S. by W.: last Quarter, S.W. and W.S.W.

The great body of the tide runs in the direction of the channels, at the rate of 2 or 3 knots on the springs, and 1 and 1½ knots on the neaps; the greatest rise and fall at the Upper Gaspar Light being 12 or 13 ft., and at the Lower Floating Light 9 ft. It is H.W. on F. and C. of the moon at about 9 h.

The Tides in the River Hoogly run with great rapidity on the springs, sometimes above 7 m. an hour between Saugor and Calcutta, but not so strong in the channels outside. They flow highest during the S.W. monsoon, the rivers being swelled by the rain which falls in the interior, and the ocean water impelled against the shores by strong S. winds adds to the rise of the tides in this season; whereas the N. winds blowing from the land in the N.E. monsoon facilitate the progress of the water from the rivers; for then the quantity of water is less, with a smaller rise and fall of tide in the day-time, than in the S.W. monsoon. Strangers should be careful when passing between Calcutta and the lower parts of the river in boats *during the night*, for many lives have been lost through the apathy and neglect of the country boatmen, in running foul of vessels anchored in the stream, when by the rapidity of the tides the boats were immediately overset or broken in pieces. To avoid an accident of this kind, it is prudent, in proceeding upward with the flood, to keep near one of the sides of the river, out of the track of ships or large vessels which happen to be at anchor.

At Calcutta it is H.W. *about* 2 h. 30 m. on F. and C. of the moon, the difference of time, between it and the tail of the E. Sea Reef, being 5¾ h.; so that it is nearly H.W. at the former place when it is L.W. at the sea reefs.

The Bore, in the River Hoogly, is occasioned by the rain in the country imparting greater velocity and duration than usual to the tide of ebb, to overcome which, an excessive effort is made by the first of the flood, producing that sudden and abrupt influx called the Bore. It is seldom perceptible in the N.E. monsoon, except when the tides are higher than usual; but about the equinoctial tides, in March, it is at times high and dangerous. From May to Oct., when the river is greatly elevated, the Bore frequently prevails for several days at the height of the springs; it is first discernible on the Diamond Sand, below Diamond Harbour, and becomes more conspicuous on the sands at Hoogly Point, a few leagues farther up, where it meets with great resistance by the sudden bending of the river to the W.: from thence it runs high over all the principal sands as far as Hoogly Town, distant near 70 m., employing hardly four hours to travel this distance; and its general velocity is nearly 20 m. in the hour. On the sands contiguous to the banks of the river, the Bore rises in a large wave, sometimes 12 or 15 ft. perpendicular, and rolling along with great noise as the harbinger of the flood-tide, carries every floating body along with it, and will overset any boat or small vessel that may happen to be on the sands, or in shoal water near them. It is discernible in the day at a considerable distance, and the roaring noise indicates its approach in the night, when instantly all boats in shoal water should quickly pull farther out into deep water for safety, where the waves do not break, the water being only much agitated with a confused swell.

At Calcutta the shore is steep, with deep water near it; here the boats do not all leave the shore when the Bore is approaching, but the people stretch a rope upon the land and haul them as far in as possible, when they are lifted up by the great swell of water occasioned by the Bore, which at times rises instantaneously to the high-water mark of neap-tides. Europeans should be cautious in the night, if upon the river, or crossing it in boats near L.W. spring-tides, when the Bore is liable to happen; they ought to keep in deep water, for if it approach when they are aground on any of the sands, or in shoal water near them, they will be in the greatest danger of perishing.

RECENT NOTES ABOUT PILOTS AND LIGHTS.

The Pilot's Ridge Light-vessel is described at page 472. During the day she hoists a large St. George's jack (white with red cross), and she rides usually to the Southward of the buoy.

The Mutlah Light-ship is painted *red*, and thus distinguishable from others.

The supplying Pilot Brig, having the pilot of the *turn* on board, to take the ship to Calcutta, hoists a *red* flag at the main.

The taking-out Pilot Brig, having to take back the pilots from outward-bound ships, hoists a *white* flag at the fore.

It is expected that after June, 1874, *two* pilot brigs only (instead of *three*) will remain outside, and probably the cruising ground on the Ridge will be abandoned, and the *Supplying* Brig be found a little to windward of the Eastern Channel Light.

Making the Sand-Heads. In Sept. and the following months, and even in the latter part of August, when Easterly winds begin, a strong set to the W. is felt, and every endeavour should be made to ensure keeping to the Eastward. Sailing vessels, that get to leeward of the Eastern Channel entrance, experience the greatest difficulty in getting back, and may lose a week or ten days, in working to windward against that lee current.

CHAPTER XVI.

CALCUTTA TO BURMAH.

CALCUTTA—RIVER MUTLAH—SUNDERBUNDS—MORRELLGUNJ—GANGES AND MEGNA RIVERS—SUNDEEP ISLAND—CHITTAGONG—KOOTUBDEAH AND MASCAL ISLANDS—ELEPHANT POINT—NAAF RIVER—ST. MARTIN'S ISLAND—AKYAB—OYSTER REEF—KYOUK PHYOO—CHEDUBA—GWA—CAPE NEGRAIS—BASSEIN—ALGUADA REEF—IRRIWADY RIVER—RANGOON—MOULMEIN—KALEGOUK—MOSCOS ISLANDS—TAVOY—TENASSERIM—MERGUI ARCHIPELAGO—HASTINGS HARBOUR—PAK-CHAN RIVER—SIAM FRONTIER—PREPARIS AND COCOS—ANDAMAN AND NICOBAR ISLANDS.

(VARIATION AT CALCUTTA, 2° E.; AT RANGOON, 2½° E.; AT PAK-CHAN, 2° E.)

Notice to Mariners.—Signal Stations in the Hoogly. The following Act to enforce the hoisting of Signals of the Names of Vessels passing Signal Stations established on the River Hoogly and the branches thereof, was published in 1862:—

1. The master of every inward, or outward-bound vessel, on arriving within signal distance of any signal station, established within the limits of the River Hoogly, or within the limits of any channel, which may be made subject to the provisions of Act XXII., of 1855, shall, on the requisition of the pilot who may be in charge, signify the name of the vessel, by hoisting the number by which she is known, or by adopting such other means to this end as may be practicable and usual, and shall keep the signal flying until it be answered from the signal station.

2. Any master who shall refuse or neglect to conform to the above rule, shall be liable on conviction, for each instance of refusal or neglect, to a fine not exceeding 1,000 rupees.

3 Every pilot shall require the number of the vessel of which he is in charge to be duly signalled, as provided under Section 1 of this Act. When on a requisition from the pilot to that effect, the master, not employed in the service of Government, shall refuse to hoist the number of a vessel, or to adopt such other means of making her name known as may be practicable and usual, the pilot in charge of such vessel may, on arrival at the first place of safe anchorage, anchor, and refuse to proceed on his course, until the requisition shall have been complied with.

4. Any pilot in charge, who may be proved guilty of neglect to obey, or of connivance with the master in disobeying the provisions of this Act, shall be liable to a penalty not exceeding 500 rupees for each instance of neglect or connivance, and in addition shall be liable to dismissal from his appointment.

THE SANDS, REEFS AND ISLANDS at the entrance of rivers like the Hoogly, are necessarily subject to such great and rapid changes, that any attempt at a *minute* description of them would be more mischievous than useful; a general notice of their extent and position is all that can be given. **The W. Brace** begins at the parallel of 21° 40′ N., near Sola Creek, about 2 m. from the shore, and extends in the form of a crescent, having its convex side to the W., to lat. 21° 12′ N. On the N. part it is very shoal, and about 2 m. broad, but becomes between 3 and 4 m. wide in the middle, where the depths are from 2 to 3 fathoms at L. W., gradually increasing to 7 or 8 fathoms on its S. extremity, where it is insensibly lost in 9 fathoms, soft ground. **The E. Brace** is about 3 m. to the E. of the former, and appears to be an extension in a S.W. by S. direction of the bank on the S. side of the Ingellee River. Its greatest width is between 4 and 5 m., and its S. extreme is in lat. 21° 22½ N., with depths on it from 1 to 4 fathoms. **The W. Sea Reef,** hereafter described, is a continuation of this bank. **The Barabulla,** and other smaller and parallel sands, lie to the E. of the E. Brace, dividing the N. part of the great Western Channel into several smaller ones. **The Long Sand,** which with its S. continuation, called the E. Sea Reef, forms the E. side of the Western Channel, extends to the N. as far as Kedgeree, where it terminates in a low island now covered with grass; its average width is from 1 to 2 m. There are patches on its N. part, which are dry at L. W. The portions of the sand to S. of Saugor Island project S. by E. in parallel ridges, forming between the Saugor Sand and the E. Sea Reef the passages called Gaspar and Thornhill Channels.

The W. Sea Reef is a continuation of the E. Brace, extending nearly S.S.E. to lat. 21° 0′ N. It is in general about 4 m. broad, the depths at L.W. 1¼ and 2 fathoms on the N. part, deepening gradually to 3 and 4 fathoms farther S., to 7 fathoms on the S. extremity.

THE E. SEA REEF, stretching out more sea-ward than any of the others, being a continuation of the Long Sand and of the Gaspar Sand, extends about S.S.E. to lat. 20° 58′ N., the tail of this reef being distant about 10 m. from that of the W. Sea Reef forming between them the **Western Channel.** The depths on the sand gradually increase from 1½ fathoms on its N. end to 3 and 4 in the middle, and thence to 9 and 10 fathoms at its S. extreme. Its general width is between 3 and 4 m. Upon the Sea Reefs the bottom is hard sand, with bright specks like steel filings: and on the ebb-tide, or near L.W., the lead rebounds from it similar to striking on a rock. The difference in depth between H.W. and L.W. on them at spring tides, is generally about 10 or 11 ft.; and the water is highest over the ground, upon the Sea Reefs, and in Ballasore Road, about 9 or 9¼ h. on F. and C. of moon. From 7 to 8 leagues S. of the tails of the Sea Reefs, the depths are from 50 to 60 fathoms on the outer edge of soundings: from thence the decrease is regular over a bottom of soft mud, to 9 and 10 fathoms close to their tails; and sudden to 6 and 7 fathoms, hard ground upon them.

Saugor Sand extends from the S.E. part of Saugor Island about S.S.E., in a parallel direction to the Eastern Sea Reef, and terminates on the meridian of 88° 18′ E., in lat. 21° 6′ N., where the depth is 5 fathoms. It is very dangerous, with patches dry at L.W towards the land, and there is not more than 5 or 6 ft. on it at L. W., for a great distance to the S. The quality of the bottom is hard sand, mixed with bright specks like steel filings, but rather of a darker colour than the Sea Reefs. The Outer Light-vessel is now 6 m. to the S.W. of the W. tail of Saugor Sand, but the E. tail is about 9 m. to the E. of the Light-vessel; and therefore ships, coming from the E. in the N.E. monsoon, cannot now (as formerly) mistake the hard soundings they get on it for the soundings of the E. Sea Reef, and work up in Lacam channel, on the E. side of the Saugor Sand. That sand may be considered as the *third* reef that extends far out into the sea; the W. Sea Reef being the first, the E. Sea Reef the second, and Saugor Sand the third reef, forming between them the E. and W. entrance-channels. **Saugor Island** extends N. and S. from lat. 21° 35′ N. to 21° 56′ N., and bounds the great entrance of the River Hooghly on its E. side. It is 21 m. in length and 6 in breadth, and like all the land hereabout is generally low. The Barratulla River, generally called the Channel Creek, separates it from the other land, and it is itself divided into several portions by narrow creeks; the S. part of the island bears the name of Gunga Saugor. **Subtermooky Sand** projects from the entrance of the Subtermooky River in a S.S.E. direction 30 m., forming the E. side of Lacam Channel; and from Bulcherry Island at the entrance of the Jumera River, the **Bulcherry Sand** projects nearly the same distance in the same direction, forming a channel between them leading to the entrance of both rivers. To the E. of the Bulcherry Sand lies the W. channel into the Mutlah River, off which is placed a *temporary* light-ship, moored in 9 fathoms, in lat. 21° 6′ N., lon. 88° 48′ E.

LIGHTS. The Pilots' Ridge Light (during S.W. monsoon only) in lat. 20° 50′ N., lon. 87° 41′ E., now is shown from a regular Light-vessel, which by day hoists a *White* flag with *Red* cross, and has been described at page 472.

The Lower, or E. Channel Light-vessel, in lat. 21° 3′ N., lon. 88° 15′ E., moored in 8½ fathoms at L.W., shows a *fixed* light. Between March 15th and Sept. 15th, she burns a Blue light every half hour, and a maroon torch at the quarters, commencing at 7 h. p.m. From Oct. to March (the N.E. monsoon), she burns a maroon torch every half hour, and a Blue light every hour In the S.W. monsoon, she is moved more to sea-ward into lat. 21° N.

The Lower Gaspar Light-vessel, showing a *fixed* light, is moored in 4 fathoms (L. W. depth) about 23 m. N. by W. ¾ W. from the E. Channel Light-ship.

The Upper Gaspar Light-vessel, showing also a *fixed* light, is moored in 3½ fathoms (L. W. depth) about 5¾ m., N.W. ½ N., from the Lower Gaspar. Its position is sometimes altered as the channel shifts; but it is about 7¾ m. on a S. by E. bearing from Saugor Light.

Saugor Light. In 1852 an iron light-house was erected on Middleton Point, in lat. 21° 38½′ N., lon. 88° 3½′ E.; exhibits a *fixed* light *flashing* every twenty seconds, 88 ft. above H. W., and visible from 4 to 5 leagues; it is situated about 200 yards from L. W. mark, and the light-house is roofed with copper. The **Electric Telegraph** extends from hence to Calcutta, by which vessels are reported on showing their number, or any communication required. Fresh provisions and water can be obtained, by application to the superintendent of the light-house.

Cowcolly Light. On Kaokali Point, bearing N.N.W. ½ W. 13 m. from Middleton Point, stands Cowcolly, or Kedgeree *fixed* light, 62 ft. above H.W., visible 15 m. The *channel*, abreast

of the light-house is 1¼ m. wide only, with depths from 4 to 9 fathoms; this light lies 2 m. S.W. of Kedgeree point on the W. side of the River Hoogly.

The Mutlah Light-vessel, *temporary*, in lat. 21° 6′ N., lon. 88° 48′ E., in 9 fathoms, bears about E. ½ N. in the N.E. monsoon, and E. by N in the S.W. monsoon, from the East Channel Light-ship, distant 19½ leagues. She shows a *fixed* light, at night, and by day hoists a *Red* flag at the main-mast. If in her position,* between March 16th and Oct. 16th, at 8 h. p.m., at midnight, and at 4 h. a.m., she fires a rocket. The vessel is painted red.

Houses of Refuge, for cast-away mariners, have been established at short intervals along the sea-face of the Sunderbunds hereabouts. In each house there is a supply of biscuit and water, which will be easily found by reading the instructions put up in each, which also give other directions that will be useful. Persons cast away, reaching land to the E. of Saugor Island, should make search for a House of Refuge; and it should be borne in mind, that when a vessel is lost with a pilot on board, the fact would soon become known at the Pilot Station and in Calcutta. Parties, therefore, finding their way to the houses, should remain there, and husband the means of subsistence, in the assurance that succour will speedily reach them; or if compelled to leave, endeavour to get W. to Saugor Island, and travel along the beach until they arrive at the light-house; or make their way to a large fishing-village, situated on the S.E. side of Saugor Island, using the catamaran as far as practicable.

House of Refuge (No. 1) is at Seyer Point, bearing N.E by E. about 10 m. from the Gaspar Channel Light-vessel; it is painted *red*, and erected on a plain to the E, of some high sand-hills. House of Refuge (No. 2), painted white; is 200 yards from H. W. mark, in the midst of thick low jungle; and E.N.E. from the first, distant 10 m; it is situated on the most sea-ward piece of dry land, between the Subtermooky and Jumera Rivers. On the E. side of Jumera River, is a House of Refuge (No. 3), painted black, and 200 yards from H. W. mark. No 4 is white on the S.E. part of Dalhousie's Island, at the E. side of Mutlah River, about 5 ft. above H. W., distinguishable by a white flag close to the house, and visible above the trees. No 5 also is white, on the S.E. part of Bangadoonee Island, about 9 m to the E. of No. 4; a flag is hoisted as at No. 4. A catamaran and paddles, a letter of instruction, and a chart of the Soonderbuns, will be found in each house. No. 5 Refuge is about 15 leagues to the N.E. of the Outer Light-ship.

THE ENTRANCE-CHANNELS, like the Banks, being subject to frequent changes, require an accurate chart or local knowledge for their navigation, and can, therefore, be only noticed in their general character. The navigable channels in the River Hoogly are, first:—**Inside Channel,** stretching from Ballasore close along the shore to Kedgeree, inside of, or to the N.W. of all the shoals, with depths in it generally from 1½ to 3 fathoms at L. W.; this is used by the small coasting-vessels, which are navigated by natives, and draw little water.

Western Channel, (formerly called the Fairway) is bounded on the E. side by the Long Sand, and beyond its extremity, by the tail of the E. Sea Reef, and on the W. side by the Barabulla, the E. Brace, and W. Sea Reef A buoy, called the South Channel buoy, is placed mid-way between the Sea Reefs on the parallel of 21° N., to mark the entrance of the channel. About 16 m. to the N. of the buoy, a narrow sand of 2½ to 4 and 5 fathoms divides the channel midway, and similar banks as the land is approached subdivide it again into several, for the safe navigation of which a pilot is necessarily required. This channel cannot be navigated with safety *at present* by ships drawing above 14 or 15 ft. water.

Middle Channel, formed between the Long Sand to the W., and the E. Sea Reef and Gaspar Sands to the E., is narrow, with only 3 fathoms water in several places; it is therefore seldom navigated by vessels of any description.

Saugor, or Eastern Channel, formed by the E. Sea Reef on the W. Side, and Saugor Sand to the E., is that *at present* in general use by ships entering or departing from the River Hoogly. There is a light-vessel, and also a buoy N.W. of her, to mark the entrance of the channel, in lat. 21° 3½′ N., lon. 88° 12′ E., moored in 7½ fathoms, showing a bright *fixed* light from 15th March to 15th Sept., and bears from the buoy on the Pilot's Ridge N.E. by E. ½ E. 33 m. This E. channel, or Lower Light-vessel burns a Blue light every half hour, and a maroon every quarter of an hour during the night, commencing at 7 p m. During the N.E. monsoon, commencing in Oct. and ending in March, this light-vessel burns a maroon or torch every half hour, and a Blue light every hour: the cruising-ground where ships will have to seek pilots in the N.E. monsoon will be, as heretofore, in the Eastern Channel.

Two Reef Buoys are now placed near the edge of the E. Sea Reef; the **lower buoy** in lat. 21° 5½′ N., and the **upper** about 6 m. to N.W. by N. of that; these buoys are *Red*, and ride greatly

* It is hoped that the Mutlah Light-vessel will not be removed from the above position.

elevated, resembling beacons when viewed at a distance, and are discerned much farther than those of the common construction. When near the upper Reef Buoy, the Lower Gaspar Light-vessel is visible, and soon afterwards the Upper Gaspar, and the trees on Saugor Island, may be seen from the poop of a large ship. It is important to observe the difference as to the Blue lights and maroons shown by the Eastern Channel and Pilot's Ridge Light respectively, as, if this is attended to, a vessel cannot possibly mistake one for the other. In the S.W. monsoon this E. Channel or Lower Floating Light is removed to about lat. 21° 0′ N.

Spit Buoy. About 6 m. N.N.W. from the Upper Reef Buoy, and in lat. 21° 17′ N., there is, near the edge of the E. Reef, a *red* buoy, called the Spit Buoy, at 9 m. N.N.E. of which will be found the Lower Gaspar Light-vessel, which is moored at the entrance of the Gaspar Channel, in 4 fathoms, in lat. 21° 25′ N., lon. 88° 8′ E., showing a *fixed* bright light; and it bears N. by W. ½ W. 23 m. from the Eastern Channel light-vessel, when at her N.E. monsoon station.

A ship arriving at the entrance of Saugor Channel during favourable weather in the N.E. monsoon, and certain of her situation, may work up a considerable way with safety in search of a pilot. In doing this she may borrow on the edge of the E. Sea Reef in tacking from the W. side of the channel, as the water shoals regularly upon the verge of it on that side although rather quick in some places. The depths in mid-channel, from 8½ and 9 fathoms, between the tail of the Sea Reef and the tail of Saugor Sand, will decrease gradually as she works to the N., to about 5 fathoms when near the Upper Reef Buoy. Here the depths are nearly the same from side to side, there being only about ½ fathom more water toward Saugor Sand than there is in the W. side near the Sea Reef.

Near the Upper Reef Buoy, or about lat. 21° 10′ N., a ship ought not to stand so near the edge of Saugor Sand as to shoal her water in working farther to the N.: for it is steep-to, and dangerous to borrow upon. The best guide is to take the soundings from the edge of the Sea Reef, which may be approached to 5 fathoms in working, until 3 m. to N. of the Upper Reef Buoy, or until the Spit Buoy is seen; then the Upper Light-vessel will be visible, also the trees on Saugor Island, from the poop or mizen shrouds, if the weather is clear; and she ought to anchor until a pilot is obtained. Here she will have 4½ or 5 fathoms at L.W. in the proper track, and it would be imprudent to venture farther up the channel without a pilot.

The old Thornhill Channel entrance used to be about 11 m. S. of Saugor Island, but the entrance of that channel from the E. Channel is now closed. Thornhill's, in conjunction with the Reef Head Passage, now forms a channel of communication between the W. Channel and Saugor Roads. There is a bar with only 13 ft. (at L.W. springs) on it in the upper part, and the channel is very narrow. The water in the Eastern Channel is comparatively smooth, being sheltered by the reef; yet, in a ship of considerable draught, half-flood, or even later, is the best time to pass through it, in order to be certain of sufficient depth of water; the tide rises in Gaspar Channel on the springs about 13 ft., and when not influenced by fresh gales, it is H.W. about 8 h. 20 m.

The present Saugor or Gaspar Channel, is formed by the Middle Ground Sand on the W. side, and by a spit projecting from Saugor Island. Near the end of this spit, on the E. side of the channel, there are 3 buoys. The W. side of the channel is marked by the two Gaspar Light-vessels, and two buoys between. The excellent pilots of Calcutta only know all the channels; and, as the banks frequently shift, it is impossible to give accurate directions. The fair Gaspar Channel *now* cuts through the old spit from Saugor Island, about 8 m. to S. by E. of Saugor Light; the detached outer part is called the Middle Ground. The anchoring buoy in Saugor Road bears about N.N.W. ½ W., and nearly 5 m. above Upper Gaspar Light, and 3½ m. to S.S.W. of Saugor Light-house. As the tides in S.W. gales generally set strong to the E., attention to the buoys is requisite to observe the way a ship is driving, and the weather side of the channels should be kept on board, remembering that the tide does not set fair through those channels, for the ebb runs to the S.W. over the reefs, and the flood to the N.E.

Lacam Channel appears now to be closed to strangers, and the common passage into both the Subtermooky and Jumera Rivers is to the E. of Subtermooky Sand.

Channel Creek, called by the natives Barratulla, is a small branch of Hoogly River, dividing Clive Island and Saugor Island, and then taking a direction on the E. side of Saugor Sand to seaward about S.S.E. ½ E., passing Seyer Point, which bears N.E. by E., and is about 10 m. from Gaspar Channel Light-vessel. House of Refuge, No. 1, painted *red*, is erected on Seyer Point, on a plain, and to the E. of some high sand hills that here line the shore.

The River. As pilots are indispensable to a vessel going up to Calcutta, it is needless to describe all the windings of the river. Under no circumstances are vessels permitted to be under weigh at night between Saugor Roads and Mud Point, which is the N.W. point of Saugor Island. At Diamond Harbour, 43 m. above Saugor Light-house, moorings are laid down for vessels arriving in distress from loss of anchors and cables; many vessels on arrival or departure are found lying here. The James and Mary Sand, just above the Hoogly Semaphore, is the most dangerous shoal

in the River. Above that the navigation has been improved by lights, so that steamers may pass up or down by night. Pilots may bring in steamers, at a draught of 22 ft., but sailing-vessels with only 20 ft.; for vessels drawing more than this, the Master Attendant of Calcutta can give special permission, at certain times of tide, to bring them above Cowcolly Light-house. The Port Rules will be found elsewhere. (*See* Index).

CALCUTTA is on the E. or left bank of the Hoogly; the flag-staff of Fort William being in lat. 22° 33½′ N., lon. 88° 19′ 40″ E. The station of the East Indian Railway, leading to Delhi and to Bombay, is at Howrah, opposite Calcutta; but that of the Eastern Bengal Railway, leading to Dacca, is on the Calcutta side. Here is also the terminus of the line that runs to Port Canning on the Mutlah River, but that port appears to be little used.

Chandernagore, a French settlement, in lat. 22° 52′ N., lon. 88° 25′ E., is on the *right*, or W. bank of the Hoogly, about 20 m. above Calcutta. This place, like all the small settlements of the French scattered about British India, is subject to Pondicherry. Chandernagore can be reached by rail from Howrah in little more than one hour. A century ago it possessed great opulence, and the largest ships could lie close to the town.

APPROACHING CALCUTTA SAND-HEADS FROM THE E. Ships bound to the Hoogly River during the N.E. monsoon, were formerly directed to keep close along the coast of Aracan to lat. 21° N., or in sight of the White Cliffs, and from thence to steer W., or W. by N., between lat. 21° N. and 21° 20′ N. This circuitous route was chosen that ships might be enabled to anchor in moderate depths when calms and faint airs prevailed, and to prevent currents occasioned by the freshes out of the rivers drifting them to the S. out of soundings. These S. currents are, however, seldom experienced except in the vicinity of the land, where also faint airs and calms prevail more than farther out in the open sea; on which account it seems advisable to keep at a moderate distance from the Aracan coast, and the N.E. angle of the bay, in proceeding to the River Hoogly in the N.E. monsoon. Whether a ship has departed from the vicinity of the Andaman Islands or from Cape Negrais, she ought to endeavour to make as much *Northing* as the winds will permit, taking care not to get too far to the W.: this will be avoided by tacking to the E. at times, when the wind veers more to N. than usual. In an indifferently-sailing ship, or when the longitude is not correctly ascertained, it may be prudent to endeavour to get into soundings about 14 or 15 leagues to the E. of the Mutlah Light-vessel, then cross over the Swatch, or chasm in the bank of soundings, which will point out the true situation.

The Swatch of No-ground extends nearly N.N.E. from lat. 21° to 21° 22′ N., and is about 3 leagues broad; but its shape and dimensions are not *exactly* determined; there are no soundings to be got in it, with from 150 to 50 or 60 fathoms of line. Its N. extremity is distant from the land only about 6 leagues, with depths between them from 13 fathoms near the former, decreasing to 3 fathoms towards the land. Round the other parts of it, the depths are generally from 40 to 20 fathoms. The W. edge of the Swatch, in lat. 21° 12′ N., is *about* 25 m. to the E. of the Mutlah Light-vessel. (*See* page 477).

Ships getting into soundings far to the E. ought to borrow towards the land to 17 or 20 fathoms, that they may be enabled to anchor in moderate depths when requisite, or benefit by the tides when favourable for proceeding to the W. For in deep water calms are frequent, with a drain of E. current in the N.E. angle of the bay, and the influence of the ebbs setting to the S. reaches farther out than that of the flood-tides. It is advisable for all ships bound to the Hoogly River from the commencement of the N.E. monsoon to its failure in the early part of March, to endeavour not to get to the W. of the Eastern Sea Reef; but rather to obtain soundings on this reef, or on the tail of Saugor Sand, that their true situation may be known. A ship coming directly from the S. upon the tail of a sea reef cannot be certain on which of them she has struck soundings, although her longitude may be known tolerably well. She ought, in this case, to keep a good look-out for ships coming out of the river, and if several are seen, or a single large one be standing out to sea, her situation may be known: for in all *probability* those ships are proceeding out by the Eastern Channel.

To approach the Eastern Channel from sea-ward, the most advisable method is to get soundings on the tail of the Subtermooky Sand or Saugor Sand. To effect this, a ship should endeavour to get into lat. 21° 4′ or 21° 5′ N., whilst to the E. of Saugor Sand, and steer W., keeping in 8½ fathoms at L. W., or about 9½ or 10 fathoms at H. W. If the Mutlah Light-vessel is in position, that will be her guide. She will have soft ground in this parallel until the depths decrease suddenly on the tail of Saugor Sand, over a hard bottom. If near L. W., she may edge to the S. a little, and after crossing its S. extremity in 5 to 7 fathoms, haul to the N.W. into the proper channel. If more than half-flood, she may cross over Saugor Sand when the latitude does not exceed 21° 7′ N.; but this sand or reef being steep on both sides, ought always to be approached with caution particularly to the N. of the latitude last mentioned. If in steering to the W., a ship keep exactly

in lat. 21° 0′ N., she will miss the tail of Saugor Sand, but may sight the Outer or E. Channel Light-vessel. It seems, however, preferable to keep so far up as to get the first hard soundings on the Subtermooky or the Saugor Sands, when the weather is favourable and the sea smooth, to prevent mistakes; for many ships have thought the soundings they had to be those of the E. Sea Reef, when they came upon it from the S. When soundings have been obtained on the tail of Saugor Sand, and a ship's true place is ascertained, by sighting the Outer Light off the Eastern Channel, she may, if no pilot-vessel is discerned, work up in search of one to the Reef Buoy.

THE SUNDERBUNDS, OR DELTA OF THE GANGES.

The Coast of Bengal, from Hoogly River to the principal mouth of the Ganges, is all very low, without any distinguishing marks; and the country is a level, woody plain, generally called the Sunderbunds, or Soonderbuns. The low country, or *Delta of the Ganges*, is intersected in various directions by numerous small branches of that great river and other rivers, which communicate by lateral branches, and most of them are discharged by wide channels into the sea.

Roymatlah, or Mutlah River, about 30 m. to the E. of Saugor, separated from Jumera River by Bulcherry Island and flats, is above a league wide at the entrance, the channel leading in a N. direction. The depths at the entrance are 9 or 10 fathoms; and the S. extremity of the land that bounds it on the E. side is in lat. 21° 32′ N., having a very shoal bank extending from it to sea-ward about 7 leagues. Bulcherry Island, on the W. side of the entrance, is large, separated from the other land only by a narrow creek.

Port Canning on the Mutlah. This port, in lat. 22° 20′ N., lon. 88° 39′ E., hastily adopted because its river is easier of navigation, and deeper than the Hoogly, was very little frequented by shipping from the first; although only 55 m. from the sea, and having a railway to Calcutta. It is *said* now that the Government has withdrawn its countenance from this place, and it is no longer one of the chief ports. But, as it may be adopted still by some vessels, we retain the following directions for its navigation.

DIRECTIONS FOR THE RIVER MUTLAH. The W., or Ward's Channel, is bounded on the W. by the Bulcherry Reef, or Sand, extending S. from the island of that name; and on the E. by the Roymutlah Sand, part of which dries at L. W. This channel is from 2 to 5 m. wide, and is marked off by the **Mutlah Floating Light** (*temporary*) off its entrance, in 9 fathoms, in lat. 21° 6′ N., lon. 88° 48′ E., and by six buoys, four *Red*, on the W. side, and two *Black*, on the E. side.

Buoys on W. side. The outermost, or **Reef Buoy,** is a first class spire buoy, with two baskets on it; it is painted *Red*, and marked with the letter M; it lies in 4½ fathoms, L. W., spring tides; lat. 21° 10′ N., lon. 88° 43′ E., or 5 m. to N.W. of the Mutlah Floating Light; and bears from the Eastern Channel Floating Light Buoy, E. by N. ½ N., distant 32 m. The **centre** Bulcherry Buoy is a second-class spire buoy, with one basket on it; it is painted *Red*, and marked MUTLAH in full; it lies in 4 fathoms, L. W., about 7 m. N.N.W. from the outer, or Reef Buoy. The Bulcherry **Spit Buoy** is also a spire buoy, painted *Red;* it lies in 4 fathoms, L. W., on a spit of the sand, about 9 m. N. ½ W. of the centre buoy. The **upper** Bulcherry Buoy is also a spire buoy, painted *Red;* it lies in 3¾ fathoms, about 6 m. N. by W. from the Spit Buoy, and W. by S. ¾ S. of the flag-staff or beacon (60 ft. high) on Dalhousie Point. This beacon is 28 m. to N. by W. of the Mutlah Light-vessel.

Buoys on E. side. The outer E. buoy of this channel is a second-class spire buoy, painted *Black*, with one basket on it; it lies in 4¼ fathoms, L. W., on the S.W. verge of the Roymutlah Sand, N.E. by N. of the Reef Buoy, distant about 5½ m. In Jan., 1857, a floating light-vessel was placed about 6 m. or 7 m. to the S. of this black buoy, in 9 fathoms, in lat. 21° 6′ N., lon. 88° 48′ E., exhibiting a *fixed* light, visible 7 m. The Roymutlah W. Spit Buoy is a second-class spire buoy, painted *Black;* it lies in 4 fathoms, L. W., N.W. ½ N. from the outer black buoy, distant about 10 m., and N. about 6 m. from the centre Bulcherry Buoy. The mid-channel course from sea to abreast of the above Spit Buoy is N.N.W. ½ W. 15 m. From that point a N. course of 15 m. will carry a vessel up to Halliday's Island; the beacon on which bears about N.W. between 5 and 6 m. from Dalhousie Island Beacon

The E., or Roymutlah Channel, is bounded by the Roymutlah Sand to the W., and the Bangadoony Sand, or Reef, to the E., and is marked off with four buoys, three *Red*, or W., one *black*, or E. **The outermost buoy** is a second-class spire buoy, with one basket upon it; it is painted *red*, marked $\frac{R}{MUTLAH}$; it lies in 5 fathoms (L. W. depth), on the S.E. verge of the Roymutlah Sand, and bearing N.E. by E., about 10 m. from the Bulcherry Reef Buoy. The Roymutlah **E. Spit Buoy** is painted *red;* it lies in 5 fathoms, at L. W., bearing N.N.W. ½ W., about 6 m. from

the outer buoy. The **upper** Roymutlah Buoy is painted *Red;* it lies in 4¾ fathoms, at L. W., and to N.W. of the Spit Buoy, distant about 5½ m.

The innermost buoy of this channel is painted *Black*; it lies in 5 fathoms, (L. W. depth), on the S. verge of a flat extending from Dalhousie Point to the S.S.E.; it bears from the upper Roymutlah Buoy N. by W., distant about 4 m. The mid-channel course in the Roymutlah Channel is N.W ½ N. to the *Black* buoy, and from that point N.N.W. to N. by W. to Halliday's Island. The bottom throughout the channels is mud, the sands exceedingly hard, and the lead an excellent and safe guide towards them. The least water in the W., or Ward's Channel, is 4 fathoms; and in the Roymutlah 5 fathoms at L. W. springs.

From Halliday's Island the course continues N. up to the "Cattalee," where the river takes a sharp turn to the W. and the channel contracts. Up to this point a stranger, with Ward's Chart, and ordinary care, could, without a pilot, conduct his ship with safety, attending to the set of the tides, leaving the *Red* buoys to the W., and *Black* buoys to the E. of his course.

Vessels resorting to the River Mutlah during the S.W. monsoon should adopt a similar route, and conform to the directions for making the Pilot Station at the entrance to the River Hoogly; thence taking a departure from Eastern Channel Floating Light, steering E. by N. ½ N. to cross the tail of the E. prong of Saugor Sand in 5 fathoms, off which they would deepen into 7 fathoms, shoaling again on the Subtermooky or old Light-house Sand to 5½ or 6 fathoms, deepening off into 6½ or 7, and crossing the Bulcherry Reef in 4½ to 5 fathoms a little S. of the Reef Buoy. The *temporary* Mutlah Light-vessel is placed about 5 m. to the S.E. of the Reef Buoy.

Commanders of vessels doubtful about crossing the tails of sands in a heavy swell could steer more to the S., and keep in 8 or 9 fathoms, soft ground; but great care would be requisite not to overrun the distance.

During the N.E. monsoon, commanders of vessels, confident of the correctness of their reckoning, should work up direct for the Bulcherry Reef Buoy; but during cloudy or thick weather, crossing the Swatch of No-ground in about the latitude of the buoy, and running down upon it, would be advisable. If the Mutlah Light-vessel be continued in its place, she will of course be the best guide.

Tide. It is H. W., on F. and C., about 9 h. 15 m. At the Bulcherry Reef Buoy the tides set round, as in the channels to the Hoogly; the floods making to the W., the ebbs to the E., having a velocity during the springs from 2½ to 3 m. per hour, and a rise of 9 ft.

Bangadoony River, the next to the E. of the Mutlah, and 5 m. from it, is small, with tolerably deep water at its mouth, and the course of the channel to sea-ward is about S.E. The entrance lies about 15 m. to N.E. of the Mutlah Light-vessel. It takes its name from an island which separates this entrance from Gua-Suby River, the next in succession to the E. A vessel of considerable burden might pass to the N. of Bangadoony Island, and moor between it and a small island in the passage, sheltered from all winds. **Gua-Suby River** is of considerable size, but the most difficult to enter of any on the coast, on account of the bending channel at its mouth. A vessel, without a pilot, should not attempt to enter it. **Roymongul Entrance,** about 5 leagues to the E. of Gua-Suby River, receives, about 2 leagues from the sea, the united streams of three rivers,—Harribanga the W.-most, Roymongul the next, and Jubunah the E.-most. The point of land on the E. side the entrance is in lat. 21° 38′ N., and lon. 89° 12′ E., with 5 and 6 fathoms in the channel close to it, and 10 or 12 fathoms inside towards Harribanga River. From the point sea-ward, in a S. by E. direction, the depths decrease gradually to 4 fathoms in this channel, and the outer part of it has a distinct bar, with 3 and 3½ fathoms at L. W., which lies about 17 m. to S. ½ E. from the point. This is one of the most considerable openings on the coast and forms a good harbour.

Mollinchew River, about 2½ leagues from Roymongul entrance, has a channel stretching in a S.S.W. direction to sea-ward, with 6 or 7 fathoms near the land, decreasing to 3 and 4 fathoms. A few miles farther to the E. is **Burrapungah River,** having its channel separated from the former by Putnay Island. From this island an extensive reef and flat stretches out 3½ or 4 leagues, on which the ship *Falmouth* was lost. H. W., on F. and C., 10 h.; rise and fall about 8 ft. Directly S. from Roymongul and Mollinchew Rivers, at the distance of 9 leagues, the **Swatch of No-ground** is situated (described at page 479). **Murjattah River,** situated 2½ or 3 leagues to the E. of Putnay Island, is wide at the entrance, the channel stretching from the land on the E. side nearly S. by W., shoaling gradually from the land to 3 or 3½ fathoms outside. About 4 or 5 m. inside the entrance of the river, two islands, called the Pavangah Islands, are situated, and on the S. one there is said to be a tank of fresh water. **Bangarah River,** about 3½ leagues E.N.E. from the former, and much smaller, has a channel stretching S.E. from the point of land on the W. side, with depths from 3 and 4 fathoms, decreasing outside to 2½ or 3 fathoms. About half-way between this

river and that of Murjattah, another small river falls into the sea, and is only a branch of the former, which all communicate with each other. The **Argo Flat** is an extensive bank of shoal soundings off the Bangarah, and extending to the Hooringottah River.

HOORINGOTTAH RIVER, situated 4¼ leagues to the N E of Bangarah River, and 33 leagues to the E. of Saugor Island, has a very spacious entrance, about 3 leagues wide, between the two great banks or shoals which form it. These project from the land on each side of the river several leagues to sea-ward, or to lat. 21° 30′ N., having 3 or 3¼ fathoms hard ground in this latitude on their extremities, and shoaling gradually to 2 and 1½ fathoms farther in towards the land. The W.-most of these, called Argo Flat, has 3½ fathoms on its extremity, in lat. 21° 31′ N., lon. 89° 50′ E., and the **W., or Great Channel,** leading into the river is on the E. side of this flat, in a S. by E. line from Tiger Point, which point forms the W. side of the river's entrance. Deer Point, on the E. side of the river, bears due N., and is 10 m. from Tiger Point; but the outermost land, that marks the E. side of Hooringottah River entrance, is called Landfall Point, the S.W. extreme of which bears about E.S.E., distant 12 m. from Tiger Point. The depths in the entrance of the channel, in lat. 21° 31′ to 21° 33′ N., and between lon. 88° 53′, and 88° 56′ E., are nearly the same as on the tails of the sands, from 3 to 3½ fathoms at L. W., and in some places rather hard bottom. These depths continue with little variation till within 5 or 6 m. of Tiger Point, when they increase to 4½ and 5½ fathoms abreast of it. About 5 or 6 m. inside the tails of the reefs lies the S. end of an extensive sand, called *Heroine* Reef, which lies off the Bishkhali River, and to the S.W. of Landfall Point. When within 7 m. of Tiger Point, there commences a Middle Ground, by which a Middle Channel is formed between it and the *Heroine* Reef, with from 3 to 3½ fathoms, water; but it is narrow, the Great Channel on the W. side of the Middle Ground being the only safe passage for large ships.

Directions. As the land at the entrance of Hooringottah River will not be discerned till a ship has entered into the channel a considerable way between the sands, the Swatch of No-ground will be a tolerable guide to direct her to the entrance of that river, observing, that from the N.E. angle of the Swatch, the S. extreme or tail of Argo Flat bears N.E. by E. about 12 m. When this flat is approached, and a ship certain of her position, she ought to steer about N. by E. or N. along its E. side, or in working up with the flood-tide (in the N.E. monsoon), she may make short tacks from it to the E., till Tiger Point is seen, then keep it bearing N. by W., which will lead her up in mid-channel, being guided by the lead. It must be observed, that **Landfall Point,** on the E. side the river, being 6 m. farther S. than Tiger Point, will be seen before it, and probably also the land on the W. shore, which stretches about S.W. by W. from Tiger Point, and the island that forms the S. side of the Bangarah River; but Tiger Point forms the W. side of the Hooringottah River, by which it will be easily known. A ship may pass this point within ½ m., also Buffalo Point, about 1½ m. N. by W. from it, she may pass at the same distance. At the entrance of Hooringottah River it is H. W. about 11 h. on F. and C. of moon, and the tide runs very strong on the springs.

Morrellgunj, in lat. 22° 23′ N., lon. 89° 53′ E., a new port on the W. bank of Hooringottah River, was declared, in 1868, to be a port for shipping and landing of goods, during the N.E. monsoon only, and to be for a time a *free* port. The experiment has given promise of success. The rivers which disembogue into the Hooringottah, pass through a part of the country abounding in rice, which is here purchased on very moderate terms; ships, therefore, have sometimes proceeded to this place, and loaded with grain for the Coromandel coast, when the prices were high at Calcutta. The *Cartier* and other ships, which loaded in Hooringottah River, were from 400 to 500 tons burden, but larger vessels can now enter, as the channel has been marked with *buoys*. A ship being about to enter it, or any of the rivers along this coast, ought to keep a boat sounding, to trace out before her the soft bottom in the proper channels, as they are imperfectly known, little frequented, *and liable to alter*, by the freshes running out against strong winds and heavy sea during the S.W. monsoon.

The Hooringottah River has lately been surveyed; but others adjoining it, both to the E. and to the W., have not been examined for more than thirty years, and the banks off their mouths must have undergone immense changes.

Aspect of Coast. Every navigator proceeding to this coast, or driven towards it by accident, *ought to remember*, that the whole of it, when first seen from a ship's mast-head at sea, has the appearance of a range of low islands covered with trees, and that the ground between the ship and them is a sloping bank, with very little water on it near the land. That the bank is cut through by a channel between each island. That these channels all have a *soft* bottom, with an increasing depth of water towards the land. When the coast can be seen from the deck, the depth of water is in general about 3 fathoms at L. W., and very few places have much more or less; the bottom at

this distance is mostly stiff ground. If a ship be in a channel, as she draws nearer the land, the ground will become *very soft*, with an increase of depth: if not in one, the ground will suddenly become *very hard*, and the depth decrease; and should this be the case, she ought immediately to haul to the E. or W., as the wind may permit, until the ground become *soft*, and there is no doubt that the depth will increase at the same time. Whenever the ground is found to be quite soft, a ship may steer for the opening without fear; as she enters it, what appeared to be an opening between islands, will be found in reality the entrance of a river. The coast not being inhabited, it is from the salt-works interspersed along it in some places that those who have the misfortune to be driven upon this coast in tempestuous weather may expect relief, either of boats or of men, to pilot them to the inhabited country. The people employed on this business have the general name of Mollingaho, and are a quiet, harmless race of men. A small supply of fresh water and a little rice may be got from them, which, with the few fowls they have, is their principal food. The crowing of jungle-cocks in the woods is often heard, which should be no inducement for strangers to go into the woods in search of people; they ought also to beware of going ashore at the Salt Churrs in the night, for both the royal tiger and the leopard are on the watch there, and often cover all the ground over at night, as may be seen by marks of their feet.

Rabnadab Island, the S. extremity, is in lat. 21° 50′ N., and 6 or 7 leagues to the E. of Hooringottah entrance. This Island is large, with a channel on each side; the W.-most, extending from the W. side of the Island about S.S.W., is narrow, but thought to have 3 or 3½ fathoms, water. The other, on the E. side, is supposed to contain nearly the same depths, but shoal water extends 9 leagues sea-ward. To the N.E. and E. of Rabnadab is a group of islands, called **Don-Manic** Islands, past which the great River Ganges debouches into the sea, and bringing down alluvial soil and sand, has formed several **sandy islets,** both to the S. and the W. of these islands.

The Ganges Sea Reefs. These spits or shoals lie nearly parallel to each other in a general S. by W. direction, extending sea-ward fully 30 m. to the S. of Rabnadab Island, and forming dangers to vessels trading to the Hooringottah, which forbid intercourse with that river during the S.W. monsoon. The **outermost banks** lie about 40 m. to E. of the head of the Swatch, and between the meridians of lon. 90° 5′ and 90° 45′ E.; they extended to the S. into lat. 21° 15′ N., and doubtless they encroach farther every year. Vessels, therefore, should never shoal under 10 fathoms by day, or 20 fathoms by night off these banks; but, to the E. of lon. 91° E., a vessel bound to Chittagong must use these **leading banks,** and feel her way round them in 7 fathoms, water. (*See* Chittagong).

The GANGES and MEGNA RIVERS, with the various islands and sand-banks forming their channels of approach, are between Rabnadab Island and the coast of Chittagong. The sea-face of the islands is near the parallel of 22° 18′ N., and the extremes of the sand-banks which project to the S. take a general N.E. direction from lat. 21° 15′ N., lon. 90° 25′ E., towards the town of Chittagong, 33 leagues. The large island of **Dukhin Shabazpoor** separates the mouth of the great River Megna from that of the Ganges; but to the N. of it these rivers communicate, and form several smaller islands. Betwixt Dukhin Shabazpoor and **Hattia,** the next island to the E., there are other smaller islands, the S.-most of which fronting the sea, called Manboura, is the largest. To the E. of Hattia are the islands of Sidi-Budu and Sun-Deep, near the main land: these are large, particularly the latter, which is the outermost. The River Megna joins the sea by the various channels formed between these islands. In Sept. this river overflowed its banks, inundated the adjacent islands, Hattia, Dukhin Shabazpoor, &c., whereby many of the cattle and inhabitants perished.

Sun-deep extends from lat. 22° 22′ N., lon. 91° 31′ E., 5 leagues to the N.; it is a fertile island, abounding with cattle, but free from tigers and other wild beasts which infest the neighbouring continent. From the S. end of the island a shoal projects about 4 leagues to sea-ward, having a channel with 3½, 4, and 5 fathoms, water, along its W. edge, leading to the principal town on the W. side of the island, situated about a mile from the shore, known by a remarkable tree near it, and a grove of palm trees. There are ferries to the neighbouring islands and the main land; but the sea-face of the banks is too little known for any sea-going ship to approach without a native pilot.

The Bank of Soundings extends for fully 70 m. to the S. of the Islands Sun-deep and Hattia. On the outer 30 m. of this bank, the depths range from 5 to 7 fathoms; so (for distinction) we call it the **Great Megna Flat,** which if properly surveyed would prove an invaluable guide, "*a leading bank*" (as it has been called) for vessels bound to Chittagong, to enable them to pass up clear of those dangerous shoals, the **N. and S. patches, or Kootubdeah Banks,** which stand out in the fairway, and several miles to the W. of Mascal and Kootubdeah Islands. The S. patches are 25 m. on a S.S.W. bearing from the Kootubdeah Light-house, but at that distance the light cannot

be seen (except from mast-head, in exceptional clear weather), and therefore **the lead** must be the mariner's guide, as he works up (with the N.E. monsoon) to the N., towards Chittagong, along the edge of the Great Megna Flat, between 6 fathoms to the W. and 9 fathoms to the E. The greatest depths of water hereabout are guts with 10 and 11 fathoms, running in a N. and S. direction, on either side of the S. Patches. When the Kootubdeah Light is in sight, it may be steered for when bearing between N.E. by N. and N.E.; but remember the **Dolphin Shoal,** which lies 4 m. to the W. of the light-house.

COAST OF CHITTAGONG.

Approaching Chittagong. The usual track from the Hoogly Eastern Channel to Chittagong, was to cross the Patch Sand, and sight the White Cliffs about Coxe Bazar, keeping to the W. of Red Crab Island, and working up betwixt the two outer sands; which track seems proper in some periods of the S.W. monsoon, when cloudy weather often prevents observations from being obtained. But in the fine weather months of either monsoon, the shortest and best passage (having more room for working if requisite) will be found to the W. of the Patch Sand; and the best guidance thereto is, by steering E. by N. from the Hoogly Outer Light-vessel, until you shoal on the flats off the Ganges mouths in about 7 fathoms, between the meridians of Landfall Point and Don-Manic Islands (*See* Hooringottah, page 482). These banks have been called *the leading sand* to Chittagong; and a vessel may make the circuit of them by keeping in 7 fathoms, hauling out to S.E., or up to N., to maintain that depth. Being about lat. 21° 12′ N., and due S. of the Don-Manic Islands, the course will be about E., till the meridian of Sun-deep Island is approached; then a nearly N. course for about 20 m. along the E. verge of the Great Megna Flat, hauling gradually to N.E., to keep in a line of 7 fathoms (L. W. depth), till you sight Kootubdeah Light. If you keep too long steering due E., you will deepen gradually into 10 or 12 fathoms off the W. edge of the Patch Sand: therefore it is advisable for all ships bound to Chittagong to haul to the N. and N.W. after getting one cast of 10 or 11 fathoms. The worst part of the Patch Sand is its N. end, which is easily discernible during daylight in blowing weather by the agitated water upon it. At the distance of ½ m. to the N. of it, you may cross to the E., carrying 8 and 9 fathoms, water; and thus situated, any vessel may steer towards Chittagong River on a N. course with safety. There is a pilot constantly in attendance, to carry ships into the river, and there are *buoys* placed on the sands to point out the channel. In the S.W. monsoon, the bar of the river looks frightful, as the sea breaks over it in most places, and the E. side of the entrance is bounded by sands, which dry at half-ebb, or at L. W. The best time to enter the river is at H. W., *slack;* as the flood sweeps rapidly across the entrance, it is dangerous to attempt going in while it is making.

CHITTAGONG, or KORNAFULI RIVER (properly Chatigaon, and called Xatigam by early Portuguese navigators) has its entrance in lat. 22° 12′ N., lon. 91° 48′ E., is formed on the N.W. side by Petunga Point and a contiguous sandy islet fronting the sea; and on the E. side by Norman Point, which is low, and projects very little from the coast-line, but now is marked by a barrel-shaped beacon on a tripod, 65 ft. high, where two vertical lights are shown at night. The breadth of the entrance between these points is about 1¼ m., but the channel is now buoyed. Pilots are to be had to take a vessel in. From the sandy islet that fronts Petunga Point, a sand projects about ½ m. to the S.W., and bounds the entrance of the channel and the bar on the W. side, the latter having 9 ft. at L. W. spring-tides. Two *white* buoys in 12 ft. mark the N. side of the bar, and two *black* buoys in 10½ ft. mark the S. side. H. W. on F. and C. at 1 h.; rise, 13 to 15 ft. in Oct., and 10 ft. on neaps. Outside the bar, the flood sets about N.N.W., and the ebb to the S.S.E., with a velocity of 3 to 4 m. an hour, usually, on the springs. At 2 m. below the town, the river is much altered, requiring a pilot; but from thence to the entrance, the new chart is a fair guide.

Lights. On the tripod at Norman Point, in lat. 22° 11′ N., lon. 91° 49′ E., two *fixed* lights (8 ft. apart) are hoisted vertically; the upper one is 38 ft. above H. W. mark. They are visible 6 m., and should be approached on a bearing between N.N.E. and N.E. by E.; and a vessel should anchor in 5 fathoms (L. W. depth), about 2 m. off the lights, on the latter bearing.

Chittagong, or Islamabad, the principal town on the coast, in lat. 22° 20′ N., lon. 91° 51′ E., is about 2½ leagues from the entrance of the river; it is a place of much trade, under the Bengal Government, there being a marine yard, where ships of considerable burden are constructed, and good sail-cloth manufactured. Grain is procured at a very reasonable rate, the adjacent country abounding in rice.

Should a vessel be driven to the N. of Chittagong River during Southerly winds, she should (if flood-tide) anchor as soon as possible, or keep under weigh until the ebb makes, when she may

work back to her port. The vast quantity of soil carried down the great rivers has filled up the channel between Sun-deep and the Chittagong coast, so that the depths, which were formerly 4 and 5 fathoms, are not more than 2 or 3 fathoms at the present time.

Sungoo River has its mouth abreast of Angor-koli, and nearly 3 leagues to the S. of Norman Point; the Fakir's Tree being about mid-way, or nearer to Chittagong. Poang-Haut is a market town about 30 m. up the Sungoo River. At 7 m. S. of Angor-koli, stands **Cuckold's Point**, in lat. 21° 57′ N., being 5 m. to N.N.E. of Kootubdeah Light-house. A shoal-bank fringes this shore and seems completely to close for navigation the N. entrance of the Uckoia Channel, passing round Kootubdeah Island. **The Dolphin Shoal** (least water 4 ft.) lies to S.W. by W. of Cuckold's Point, and 4 m. to the W. of the light-house. The passage between this shoal and Kootubdeah is 2 m. broad, and has 6 or 7 fathoms.

Kootubdeah Light-house, in lat 21° 53′ N., lon. 91° 53′ E., is built on the N.W. side of the island, and about a league from its N. point. It is 100 ft. high, and shows a *fixed* light, 120 ft. above the sea (H. W. level), and visible 17 m. off. This light may be approached by a large ship when bearing between N.E. by N. and N.E. ½ E., which course will lead her between the N. patches and a shoal which lies more than 3 m. to S.W. by S. of Dolphin Shoal. When the Light-house is about 1 league off, she may haul gradually to the N., and after passing it, keep it bearing S. by E. till the two lights on Norman Point are seen ahead.

Kootubdeah Island is low and woody, 4 leagues in length, nearly N. by E. and S. by W. On the S. end there is fresh water close to a tope of trees, and several creeks are formed on the E. side. The S. part of this Island has extensive sands projecting to the S.S.W. for 4 m.; and others run off the W. side in a S.S.W. direction from the light-house for 10 m. Outside of these are the shoals called the N. patches, which lie 3 leagues to the S. of Dolphin Shoal.

To avoid the N. and S. Patches. A ship being in 15 to 20 fathoms, abreast of Elephant Point (in lat. 21° 10′ N.), and bound to Chittagong, with the wind fair, a N.W. course will carry her outside of the shoals, if there be no oblique tide in passing them, with an offing of not less than 5 leagues from Mascal Islands. On this N.W. course, the soundings may shoal to 7 or 8 fathoms, on the tail of the S. Patches, but afterwards deepen to 10 or 11 fathoms. Thence they will shoal gradually towards 7 fathoms on the Great Megna Flat, along the E. edge of which the vessel may stand to N. and to N.E. to sight the Kootubdeah Light. When Kootubdeah Light bears N.E. by N., you may steer for it (being then to the W. of all the N. patches), approaching the Light within 2 m.: and when it bears S. by E., steer away from it on a N. by W. course, which will take you up to Chittagong Roads, passing between Dolphin Shoal and the coast.

The distance from Kootubdeah to the river's mouth is 6 leagues, and the course N. by W.; the coast between them is low and flat near the sea, but hilly 2 leagues inland. The chain of hills between Kootubdeah and the river, situated *about* 18 m. inland, ends in a point about 3 m. S. of the parallel of the river's mouth. The Fakir's Tree is thick and bushy, situated 3 m. to the S. of Norman Point, and 4 m. N. of Angor-koli, and, being close to the shore, may be discerned, although the weather be hazy. In clear weather, the hill called Shakbroaj, with two round trees and a flag-staff, may be seen when abreast of the Fakir's Tree, distant 10 or 11 m. This hill terminates to the S. a chain of low hills extending parallel to the coast, in which Seetacoon Hill, opposite to the Island Sun-deep, is the highest and most remarkable, having on it a small pagoda. The bottom, between Kootubdeah and Chittagong River, is stiff and good for anchorage; a ship bound into the river, wanting a pilot, should anchor abreast of the Fakir's Tree in 4½ fathoms, about 2 m. from the shore, from whence the beacon on Norman Point will be to the right of the flag-staff, bearing about N.N.E. In strong gales the sea here runs very short, and often breaks over a small vessel. It would be dangerous to enter the river without a pilot.

MASCAL ISLANDS. Mascal Island is about 15 m. in length from N. to S., and 6 m. in extreme breadth; it has some small elevations, and being the largest, the group is generally known by the name of the Mascal Islands. **Matrabari Island** lies on the N.W. side of Mascal Island, being only separated from it by a narrow channel, but having a deep channel between it and Kootubdeah. The chief town of Mascal Island is at its S.E. end, and accessible by the Mascal Channel to the E. of Red Crab Islet. **Eadgong,** in lat. 21° 38′ N., a place of salt manufacture, is situated up a creek behind Mascal Island. **Ramoo Town,** in lat. 21° 30′ N., is some distance up the Bagkhali River, at the mouth of which is Coxe Bazaar.

The Channel inside of Kootubdeah, which separates it from Matrabari Island and from the main, called Uckoia by the natives, has soundings in it from 4 to 5 and 6 fathoms. The N. entrance of this channel, formed between the N. end of Kootubdeah and Cuckold Point, is contracted by banks on each side, and a shoal-bank outside closes this entrance to all but small coasters.

Kootubdeah Channel. If hazy weather prevent the White Cliffs from being discerned until

a ship approach near them, when the wind is too far Westerly for her to clear the shoals, a place of shelter for small vessels may be found within the N. Patches, but a more sheltered one in Kootubdeah Channel. To gain this latter place, pass Red Crab Island, bearing E. 2½ or 3 m., and from this station steer about N. by W. in 10 to 15 fathoms, until the passage between Kootubdeah and Matrabari is quite open; then steer direct for the opening, about N.E. by N., in 10 to 7 fathoms, water, taking care to avoid the dry shoals lining the shore on both sides of the entrance: having got just within the Point of Kootubdeah, you may anchor secure in 8 to 10 fathoms, soft ground. From the point of that island a spit extends S.W. by S. several miles, with breakers on it in some places: and a bank stretches from the Mascal shore to the distance of 2 m., both of which will be avoided by keeping the passage quite open, as directed above. It would be improper to run 1 m. within the Point of Kootubdeah, for about 2 m. within the entrance, a bank projects from that island more than half-way across the channel.

The N. Patch Sand, which is steep, with high breakers, least water 4 ft., lies 13 m. to S.S.W. of Kootubdeah Light-house; and from this patch other shoals, with 12 and 15 ft., extend for 8 or 9 m. to the S. by E. This was formerly called the Inner Spit, or Middle Ground, but is now different from what it was thirty years ago. The Outer Spit, from lat. 21° 24′ to 21° 33′ N., is very dangerous, having in one spot, called the South Patch, only 6 ft. water; from whence the depth increases on the N. end of the spit to 7 and 8 fathoms, in lat. 21° 35′ N. Close to the W. edge of this spit, the depth is 10 and 11 fathoms, *decreasing to sea-ward* to 5 and 6 fathoms on what we have called the Great Megna Flat, about 7 leagues to the W. of the spit.

The S. Patch Sand is in lat. 21° 31′ N., and lon. 91° 41′ E., and 24 m. to S.S.W. of Kootubdeah Light. During the N.E. monsoon, the high land is not visible for several days together, and frequently the haze prevents Mascal Island from being seen from the channel between the S. Patch Sand and Middle Ground. This S. or Outer Patch exhibits breakers in a fresh breeze, and in fine weather the rollers on it may be perceived, but the lead affords no guide in approaching. Between it and the Middle Ground, the velocity of the tide at the springs is from 3½ to 4 m. an hour, and in this channel the ground is stiff and good for anchorage. The flood sets towards the entrance of Coxe Bazar and the channel that separates Matrabari Island from Kootubdeah, rendering it doubly necessary to keep a good offing after seeing the White Cliffs.

THE WHITE SANDY CLIFFS, fronting the sea between Mascal Island and Elephant Point, extend from lat. 21° 18½′ N. to 21° 24′ N., being 3 leagues to the N. of Elephant Point. The land to the N. of these cliffs is separated from Mascal Island and the coast of Chittagong by the opening or Strait of Cruzcool, which opening has deep water inside, but will only admit of small vessels in the narrow channel between a reef off Coxe Bazar and Red Crab Reef, that stretches from the S. end of Mascal Island about 2 leagues to the S. and S.W. **Red Crab Islet,** lying near the S.W. extremity of this reef, in lat. 21° 29′ N., and about 2½ m. from the S.W. end of Mascal Island, is merely a dry sand, with some shrubs on it, having breakers extending round to a considerable distance, with 10 and 11 fathoms near the W. edge of the reef, and 3 or 4 fathoms near its S. extremity. There are patches of sand to W. of this islet, and at 1 league off there is a depth of 17 fathoms; this gut of deep water extends to the S. end of the N. Patch, and runs up between that shoal and Kootubdeah, only shoaling to 10 fathoms farther N. Between Red Crab Reef and the main land there is a channel leading to Coxe Bazar, and to the S.E. point of Mascal Island; it has from 1½ to 3½ fathoms on the bar, and from 5 to 8 fathoms inside.

The Coast. From the White Cliffs to lat. 20° 45′ N., the coast of Chittagong continues in a narrow strip of land that forms the W. side of the Naaf River; and, except near Elephant Point, which has a reef off it, is safe to approach with tolerable anchorage. Vessels bound to Chittagong, or those that may be driven to the E. by stress of weather in the S.W. monsoon, usually endeavour to make this part of the coast; but it requires great caution, the weather being mostly cloudy or stormy, and the White Cliffs are low and not easily discerned, unless the sun is shining bright in the afternoon. If, therefore, a ship get close in, with a strong breeze, and a tide of 4 knots on the flood, she will not be able to haul out sufficiently to clear the Kootubdeah Sands, more particularly the outer patch, and will therefore be obliged to anchor in a heavy sea, with strong tides, an alternative at all times, if possible, to be avoided. If a ship make the land here, she must haul immediately to the W., to avoid the banks of Mascal and Kootubdeah.

Elephant Point, or Dombak Point, in lat. 21° 10′ N., lon. 92° 4′ E., is 3 leagues S. by E. from the S. extremity of the range of White Cliffs, and may be seen 5 leagues from the deck. A reef projects about a mile from the Point, which should not be approached under 8 fathoms, or 1½ or 2 m. distance. About 3 leagues to N.E. of this Point, there is a sugar-loaf hill. From Elephant Point, the coast of Chittagong runs in a general direction of S.E. by S. to Tek-Naaf.

COAST OF BRITISH BURMAH.

Shapoor Island, the N.W. point, in lat. 20° 46′ N., lon. 92° 19′ E., distant 9½ leagues to the S.S.E. of Elephant Point, and fronting the Naaf River, is 3½ m. in length, surrounded by shoals, which project about 2 m. to the W., nearly joining the shoals off St. Martin Island, which is about 2 leagues farther to S. There is an intricate channel between them, about 1½ and 2 m. to the S. of Shapoor Island, leading into the river, the entrance to which is bounded on the E. side by Cypress Point. Tek-Naaf is a low point of land, a little to the N. of Shapoor Island, and together with this Island forms the W. boundary of the river, which extends in a N. by W. direction nearly parallel to the coast, as far as Elephant Point. There is high table-land on the Aracan Hills, about 20 m. to S.E. of Elephant Point, and N.N.E. of Shapoor. Although the Naaf River has depths of 12 to 8 and 7 fathoms, when inside the bar and outer shoals, yet, in the opinion of Captain Crawford, who took the *Research* and flotilla into this river in Jan., it will always be dangerous for shipping; because, on the flood-tide, the surf and swell run too high in 3 fathoms, water, for ships to cross the outer bar, which has 3½ fathoms, hard bottom, on it at H. W., and this is the safest time to pass between the outer shoals into the river. It is H. W. on F. and C. at 10 h. 0 m.

ST. MARTIN ISLAND, formed of two divisions united by a dry ledge of rocks, extends from lat. 20° 34½′ to 20° 38¾′ N., and its N. end is distant 5 m. due S. from Shapoor, and 4 or 5 m. from the nearest shore: it is low, fronted by a reef on the W. side, which projects also a little way from the S. point, and forms a sort of bar between St. Martin and Shapoor. There are extensive reefs with breakers about mid-way between the Black hummock on the main and St. Martin Island, but near the E. side of the island there is anchorage in 5 and 6 fathoms, where the transports anchored, and procured fresh water from the springs. In fact, this anchorage may be considered as the mouth of the Naaf River; the bar of which might be easily crossed if buoyed.

St. Martin Reef, in lat. 20° 38′ N., lon. 92° 14′ E., is very dangerous, distant about 5½ m. directly W. from the N. part of St. Martin Island, having high breakers on it at times, and it is of considerable extent in a N. by W. and S. by E. direction. Very near it on the outside there are 10 fathoms, water, with 7 to 9 fathoms hard ground, in a safe channel between it and the island. Ships passing this reef in the night should not come under 20 fathoms; and it may be observed, that from this part of the coast soundings extend directly across the bay to Point Palmiras.

Asseerghur Shoal, in lat. 20° 28′ N., about 10 m. to the S.E. of the S. Point of St. Martin Island, and 7 m. off shore, is also dangerous. There is a channel with 6½ and 7 fathoms, water, betwixt it and the main, and 8 fathoms close to it on the outside. The coast between the Naaf and Aracan Rivers is lined by a shoal-bank, having 3 or 4 fathoms on the edge of it in some places, at 2 or 3 m. off shore.

Oyster Island, in lat. 20° 12′ N., lon. 92° 33½′ E., and 12 m. off shore, is very little above water, and is small, rocky, and dangerous, having a narrow bank or ridge, with shoal water on it, extending several miles from the Dry Rock in a S.E. direction, and nearly joining another spit of 1½ fathoms, called the **Oyster Reef,** in lat. 20° 5′ N.: there is a gap or passage of 6 and 7 fathoms between the island and reef, and from 11 to 10 fathoms, water, close to them on the outside.

Miou, or Mroo River entrance, in lat. 20° 15′ N., 13 m. E.N.E. of the Oyster Island, has a shoal-bank on each side, with 1½ or 2 fathoms on the bar, which lies 4 m. to N.E. by N. of the Oyster Reef. This river is of considerable size, extending inland to the N., and it has been sometimes mistaken for Aracan River. There is a passage of 7 to 6 fathoms betwixt the Oyster Island Reefs and the bank that fronts the mouth of Miou River, and which extends along the coast to the bar of Aracan River. This bank has breakers on it in some parts, and should not be approached even in the N.E. monsoon, under 6½ or 7 fathoms. **Heckford Patch,** with 4 fathoms only, lies 9 m. to S.S.E. of the Oyster Reef, and 12 or 13 m. to S.W. of Savage Island Light-house.

The KOLADYNE, or ARACAN RIVER. Fakirs, or Mosque Point (Booda Mokham), in lat. 20° 7′ N., lon. 92° 53′ E., forming the N. boundary of the entrance of this river, is low, and has some rocks, called the Fakirs, extending about ½ m. S.S.E. from the point; these rocks are covered at H. W., and there is a *Red buoy* to mark their S.E. extreme. There is a flag-staff on Fakirs Point. The channel into Aracan River is betwixt the Fakirs and an islet, called the Savage, situated near the N.W. point of Bolongo, the W.-most of the Broken Islands. **Akyab Town,** at 2 m. to N. of Fakir's Point, is now an important rice-port, with a Master-Attendant, and Consuls of several nations. Up the Bankshall Creek to the N. of the town, a naval yard has been established. Flat Island, lying 5 m. to N.E. of Fakir's Point, has a mud flat stretching from its S.W. end towards the point, thus narrowing the anchorage off the town: a *Black* buoy marks the S. extreme of this mud-flat.

Light. The light-house on Savage Island, in lat. 20° 5′ N., lon. 92° 53′ E., exhibits a *fixed* light 106 ft. above mean level of the sea, visible 4 leagues. This island lies a mile from the N.W. point of Bolongo Island, and a rocky bank extends between them. A dangerous rock, called Passage Rock, lies about ¼ m. to N.W. of Savage Island, with from 15 to 24 fathoms outside of it. The town of Akyab lies 1¾ m. to the N. of Fakir's Point. There are 3½ and 4 fathoms on the bar about 4 m. to the S. by W. of Savage Island Light, and 2 m. off the shore of Bolongo; but a depth of 5 fathoms is found to the E. of the *buoy*, which is placed 3 m. due S. of Savage Light; and the depths are from 8 to 10 fathoms along the W. Bolongo coast, at 2½ and 3 m. off.

Directions for Akyab. Ships sailing for Akyab during the S.W. monsoon should steer by night for the Savage Light on a N.E. by N. course; by day they should sight the table-land of W. Bolongo (where a wooden light-house* was built, in lat. 20° 1′ N., lon. 92° 56′ E.), bearing between N.E. and N.N.E.; when on the latter bearing, **the lead** may get soundings of 9 or 10 fathoms (L. W. depths) on the bank which stretches fully 8 leagues to the S. of Akyab Bar. When the light is sighted on the Savage, then bring it to bear N. by E., or N.N.E.; and if they intend to run in during the night with either of these bearings, they will cross the bar in the best water, in 3 fathoms L. W. spring tides. After deepening across it, the course should be altered to N. by W., or even N.N.W., according to the state of the tide and sea at the time, to avoid the W. Peaked Rocks (above water), bearing from the light S.W. by S., distant nearly ½ m. The flood-tide sets in on the rocks. When the light bears E., the course must be altered to N.N.E., and N.E.; having brought the light to bear S.S.E. ½ E., the ship will be inside of Passage Rock (which is 5 to 7 ft. above water, and bears from the Savage Light N.W. ½ N., distant ¼ m.), and should then steer N.E. by E., to avoid the reef projecting from Fakir's Point; some of the rocks are above water at half-ebb. There is a *Red* buoy placed off these rocks, in about 9 fathoms, which, with attention, may be seen in a clear night without the moon; and after bringing Fakir's Point to bear N.W. by W. to W.N.W., the ship should anchor. A stranger should not attempt to run in at night, particularly in the rains, except at H. or L. W., as the ebb-tide runs very rapidly, in strong eddies off Passage Rock, over the W. flat, and the flood in strong eddies upon the rocks.

During the N.E. monsoon, ships bound to Akyab from the N. should not shoal under 15 fathoms, till they make out the W. Bolongo table-land, or Savage Light (from aloft) bearing E. by N.; then steering due E., till Savage Light bears N. by E., they will pass between the Oyster Reef (which is distant from the Savage Light 15 m. due W.) and the Heckford Patch (bearing from the light about S.W., 12 or 13 m. off). Steer for the light N. by E. to cross the bar to the W. of the buoy. After deepening over the bar, haul up N.N.W. to clear the Peaked Rocks to the S.W. of the light. Then N.E. or more E. (according to the tide), to round the *Red* buoy off the Fakirs; when haul in N. by W. or N.N.W. for the inner flag-staff, anchoring in 3 or 3½ fathoms, abreast the *Black* buoy, which lies on the S. end of an extensive shoal projecting from Flat Island, which divides the river into two channels above the town.

Although in favourable weather Savage Light is seen outside the reef in 16 to 17 fathoms, water, yet in hazy or rainy weather it might be obscured. In such case, **the lead** should be the guide; the navigator feeling his way round the bank of soundings in 10 or 11 fathoms (L. W. depths); thus he would avoid the Oyster Reef and Heckford Patch, hauling close round the S. side of the latter; and he might approach the light within 9 or 10 m., when bearing N.E. by N. Steering boldly in to sight it, to the N. of lat. 20° 1′, would endanger the safety of the vessel, by suddenly falling upon the Oyster Rock or Reef before sighting the light-house. Strangers should not on any occasion make use of the channel inside of the Oyster Rock or Reef.

Arriving off Akyab *in ballast* during the N.E. monsoon, ships should anchor out in 8 or 9 fathoms outside the bar, and there get rid of as much ballast as safety permits. This will avoid the expense of discharging it inside the river by boats, for there is a strict prohibition against throwing it into the river. The table-land of the W. Bolongo (though altered in appearance since the trees on its N. part were felled to make a site for a light-house) may be seen sometimes at 30 m., and this high land is darker than that to N. of Akyab, though some of the more N. peaks near Miou River are higher and discernible at a greater distance.

Tides. It is H. W. at the anchorage off Akyab at 9 h. 45 m. on F. and C. of moon, and the greatest rise in Feb. was 9 ft. Velocity of tide in the river from 3 to 3½ m. per hour on the springs, and from 1½ to 2 m. on the neaps. Variation, 2° 15′ E.

The Broken Islands, called formerly the W., the Middle, and the E. Bolongo, are three long and narrow islands immediately to the S. of Aracan River, extending about 5 leagues N.N.W. and S.S.E., parallel and near to each other. **Borongo, or Bolongo,** the W.-most, has a reef projecting

* The W. Bolongo Light is said to be *not lighted* now, though retained on the charts.

from its S. point, and there is a reef and several small islands off the S. point of **Peny-Kyoung**, the Middle Island. Between these two there is good anchorage in 8 or 10 fathoms, mud, or in 5 fathoms farther up the Strait, where ships might be sheltered from all winds but those that blow from the S. This has been named **Research Strait**, and has only 2 and 1½ fathoms at its N. part; consequently will not admit of ships passing through into Aracan River. These islands are mountainous, woody, and rugged, without any appearance of inhabitants or cultivation; and the whole of the coast of Aracan, both to the N. and S. of them, has a similar appearance, presenting a most dreary aspect when viewed from sea. The S. ends of the Broken Islands, although bounded by rugged black rocks, are not very dangerous, as most of these are visible and do not extend far out. About 4 leagues to the W. of the W. Borongo, and parallel to it, or stretching for many miles to the S., from the Outer anchorage in 9 fathoms, off the Akyab Bar, there is a long bank, with 9 fathoms, water, in some parts, and 16 or 17 fathoms between it and the island; and at 3 leagues due S. from its S point, there is a patch of 7 fathoms in lat. 19° 40′ N., with 22 and 20 fathoms between it and the S Rocks, which stand in a line for some 6 m. to S.S.E. from the S. point of Peny-Kyoung Island, and united to that island by a ridge of rocks and islets.

THE TERRIBLES, in lat. 19° 22′ to 19° 27′ N., distant from the shore 12 m., form three visible groups of rocks extending in a N.N.E. and S.S.W. direction, some of them about 14 ft. above water, with others under water not yet explored. The N. Rock is the largest, from which a spit is said to project to the N.W. for some distance, with 20 fathoms close to it on both sides. The middle group is about a mile S.S.W. from the N. Rock. The S. group, consisting of several low rocks, is 4½ m. S.S.W. ½ W. from the N. Rock, and breakers have been seen 1 m. to the S. of it. Breakers have been also seen 2 m. W. by S., and ½ m. to N. from the N. Rock, which shows there are sunken dangers around, and that ships should not come within 2½ m. of the dry rocks. But the greatest danger to vessels entering Kyouk Phyoo Harbour, round the N. side of the Terribles, is a **submerged rock**, lying nearly 3 m. due N. of the N. Rock. A light-house is *proposed* on the S. point of these dangerous rocks in lat. 19° 22′ N., lon. 93° 17′ E.

The N. Rock is in lat. 19° 27′ N., lon. 93° 20′ E., bearing S E ¼ S. from the S. point of the W. Bolongo, distant 29 m., or 45 m. on a S.E. by S. bearing from the Savage Light: and W. by S. 11 m. from the Pagoda Rock, in Kyouk Phyoo Harbour. When coming from the W., the high peak in Combermere Bay is discernible at 8 or 9 leagues' distance in favourable weather, and it is in transit with the N. Rock of the Terribles, bearing N.E. ½ E. From the N.W. point of Cheduba, the S. group of the Terribles is about 11 leagues distant, bearing N.N.W.; near to it on the W. side there are 20 fathoms, water, and the depths increase regularly to 100 fathoms, no ground, about 6½ leagues to the W. Ships passing along this coast ought not to approach the Terribles in the night, under 28 or 30 fathoms; and in crossing the entrance of Aracan River they should not borrow toward Oyster Island, or the Heckford Patch, to less than 20 fathoms; but when to the S. of that, and if Savage Light is seen from aloft, they may haul to the S.E. and get a cast on the 9 and 10 fathoms bank which stretches many miles to the S.E. of Heckford Patch.

Hunter Bay and Combermere Bay, situated between Akyab and Kyouk Phyoo, little known to navigators, require to be properly examined. The rocks and islets are innumerable. The largest island between Hunter and Combermere Bays has some high land, very conspicuous from sea-ward, in clear weather from a distance of 40 m.: the S. Peak bears about E.S.E. distant 11 leagues from the table-land of W. Bolongo. Hunter Bay has a channel on either side of a great bank which lies off the S.E. coast of the Mengbrah sub-division of the Akyab district, and this bay is the outlet for trade of the important towns,—Mengbrah, Mraboung and Talak. Combermere Bay, though full of rocks and shoals, is the outlet of the Aeng River, which is navigable by boats up to the town of Aeng, 45 m. from its mouth. From Aeng a mountain-pass leads over the Yeomaloung Mountains, towards Ava, the capital of the Burmese kingdom.

KYOUK PHYOO HARBOUR (Fort Dalhousie), in lat. 19° 26′ N., lon. 93° 32¼ E., lies directly to the E. of the Terribles,* inside the N. point of Ramree Island. This point called Flag-staff or Sandy Point is about 6 m. E. of the N. end of Saddle Island, which lies on the S. side of the entrance channel, having reefs projecting 2 m. from its N. point. The channel is bounded on the N. side by reefs, some of which are detached, and others extend from the islands on that side, which require great caution in passing. Kyouk Phyoo is a military station, and Fort Dalhousie stands on the N. point of Ramree Island. The town is much sheltered from the violence of the S.W. monsoon by some hills to the S. and S.W.; these range in height from 500 to 1,000 ft.

Pagoda Rock, a conspicuous *white* rock, bears N.W., distant 4 m. from the flag-staff; it

* A light-house is proposed for the S. Terrible in lat. 19° 22′ N., lon. 93° 17′ E.; and as Kyouk Phyoo rises in importance, a harbour light with other beacons will be needed.

lies to the W. of other large islands, which form the N. side of the harbour. From the rocky islets off the S. end of Peny Kyoung Island (the Middle Bolongo), a bank of soundings with 9 and 10 fathoms, extends to within 2 leagues of the N. Terrible, and thence its S. edge goes straight to the Pagoda Rock.

Entering Kyouk Phyoo from the N., during the night, a careful navigator might feel his way round this bank, and approach the entrance between the buoys. In steering for the N. end of Saddle Island, which is in lat. 19° 25′ N., it should not be approached under 2½ m., and when it bears S., the Pagoda Rock should be brought to bear E.N.E. This rock is conspicuous, being white-washed, and lies 4½ m. to the N.E. of Saddle Island. The fair channel course into the harbour is then about E. by S., between two buoys; the N. buoy (*Red*) marks a detached reef; the S. one (*Black*) marks the shoals off the N.W. point of Ramree. The breadth of the channel between these dangers is little more than ½ m.: they lie 2 m. to the W.N.W. of Sandy Point, and at 1 m. to N.W. of this point lies the **Reliance Rock**, with a *Black* buoy, between which and Quoin Island the channel is a mile wide, the S. point of the island having a reef close to it, which bounds the channel on the N. side of the harbour. Buoys being now placed on all these detached shoals, which bound the entrance, this is made a very fine harbour. The soundings, to the N. of Saddle Island Reefs, are no guide, being deep and with overfalls. A chart to show the bearings of the land-marks is necessary. In the narrow part, between the buoys, the depths are irregular from 9 to 26 fathoms, continuing the same until near Sandy Point, where they decrease to 7 or 9 fathoms, at the anchorage off the village of Kyouk Phyoo.

Coming from the S. to Kyouk Phyoo Harbour, vessels may pass about 2 m. to the E. of the Terribles; but this passage requires caution, as the **Irrawaddy Shoal** lies 3½ m. W. from Saddle Island, and 4½ m. E. by S. from the N. Rock of the Terribles, being nearly in the middle of the fairway, with only 2 fathoms, water, on it, and shows breakers when there is much swell. The passage between this danger and the Terribles is, however, 3½ m. wide, with from 12 to 15 fathoms, water, and may be occasionally used in favourable weather, by keeping in mid-channel; but, between the Irrawaddy Shoal and the reef surrounding Saddle Island, a ship ought not to attempt a passage; **Dicey Shoal** lies 2 m. to the N. of Saddle Island, about 4 m. E.N.E. from Irrawaddy Shoal, and 3½ m. to S.W. of Pagoda Rock.

Fletcher Hayes Strait begins about 2½ or 3 m. to the E.S.E. of Kyouk Phyoo, stretching to the S.E., separating Ramree from other islands, and from the continent. These straits in some parts branch out into an extensive inland navigation, completely land-locked, with good depths of water, and interspersed with many beautiful islands.

Ramree Island. From Fort Dalhousie Flag-staff, the shore trends to W.S.W. and S.W. for about 2 leagues to the Outer Peak Hill, close to the sea. The sea-face thence takes a general S.E. direction for 8 leagues to Rocky Point, which forms the N. side of the entrance to Cheduba Strait. **Research Rock** is about 6 m. S. from Saddle Island, and 1½ m. from the Ramree Shore; and there are also several other straggling rocks contiguous to the W. coast of that island, but not so far out as the former. A little to the S. of the Research Rock, the soundings along the W. coast of Ramree are tolerably regular, and ships may approach to 9 or 10 fathoms, about 4 or 5 m. off shore.

CHEDUBA, or KEDOOBA, is a moderately high island, extending from lat. 18° 40′ to 18° 56′ N., its extreme width being about 15 m. It is bounded by reefs and islets, which project several miles to sea-ward, and which ought therefore to be approached with great caution in the night. The extreme W. rocks of the reef lying off the N.W. point of Cheduba are in lat. 18° 55½′ N., lon. 93° 26½′ E., bearing from the point N.W. ½ N. 5 m. From these extreme rocks the reef runs E. by N. 4 m., having along this line two small islands: **Beacon Island,** lying E., or ¾ m. within the extreme rocks, has on it a beacon of stones about 60 ft. above H. W. mark, visible 9 m.; and Sandy Island, not so high as the other, lying ¾ m. from the E. extreme of the reef, which bears from it E.N.E. Both islands have been planted with cocoa-nut trees. The soundings in the neighbourhood of the reef are regular, ranging from 4 fathoms, ½ m. off its N. face, to 8 and 9 fathoms, 3 m. off it; while at that distance off the N.W. and the W. ends, 16 and 17 fathoms are found. An outlying rock, with 7 ft. water on it, is found N.E. by E. of Beacon Island, distant ½ m.

In the N.E. monsoon the anchorage is good in all these soundings, but the reef affords no shelter from the heavy swell of the S.W. monsoon; at which season the channel between Cheduba and Ramree Islands, after carefully rounding the E. extreme of the reef, is open and available for that purpose. The tides run E. and W. along the reef 1¼ knots in the neaps, and nearly 3 knots in the springs, when they sometimes rise 8 ft. They are irregular in time. H. W. at F. and C. off the N. coast of Cheduba at 9 h. 30 m.

Ships coming in from the W., along the N. side of Cheduba, ought not to approach the reef under 11 or 12 fathoms, water, for near it the bottom is mostly rocky, and the soundings not very regular. Being within the reef, the water shoals gradually from 7 to 5½ fathoms, and the course should not be more to the S. than E. by S. until well over to the Ramree shore, where the soundings are more regular than on the Cheduba side, which is very flat and shoal to a considerable distance. By steering along the Ramree side at 2 to 1½ m. distance, there will seldom be less than 5 fathoms, and when to the S. of *Rocky Point Bay*, the water will deepen to 6 or 7 fathoms. Between the Ramree shore and Cheduba, about 5 m. to the N. of the anchorage, and about 1¼ m. from a point of Ramree, there are two rocky shoals; these dangers require great care, as they lie in the fair channel, bearing about E. ½ N. from the N. point of Cheduba, and N. by W. from its N.E. point, and opposite to a point on the Ramree shore, on which stands a bungalow. A ship should have a good chart, and in passing these dangers should keep within 1½ m. of the Ramree shore on the edge of the Mud Bank, and when the N. point of Cheduba bears W. by S., a moderate high and round island will appear to the E. of Cheduba, bearing about S. by E.; by steering for it, when past the dangerous rocky patch, as mentioned above, she will shoal gradually over to the W. towards the town of Cheduba, where she may anchor in 4 or 4½ fathoms, with Round Island bearing S. by E., and the town pagoda W. ¾ S. This pagoda has on its top a brazen image of a large bird, and is situated in lat. 18° 46′ N., lon. 93° 45′ E.

The Roadstead. In the Cheduba Road the tide rises from 6 to 10 ft.; H. W. about 11½ h. at F. and C. of moon. Ships may fill water at half-ebb in their own boats, but it will be procured more expeditiously by the country boats. The landing-place is near a small wooden bridge, at a wharf about 2 m. up the river on the starboard side, where is a bazaar well supplied with poultry, hogs, goats, fruits, and vegetables in abundance, at reasonable prices, and of excellent quality. Rice, tobacco and petroleum oil are the chief exports. From the entrance of the river, mud flats stretch 1½ m. out, making the approach difficult to a stranger; but inside, although narrow and winding, there is water sufficient for large boats at all times of tide.

The S. end of Ramree Island, forming the N.E. side of Cheduba Strait, is of moderate height near the sea, and extends from Rocky Point (in lat. 18° 59′ N.) about 6 leagues to S.E. by E.; thence the E. coast of the Island turns round to N. by E., and there forms Ramree Harbour (sometimes called Amherst Harbour). The S. point of Ramree, off which are several islands, lies directly E. from Cheduba Anchorage: betwixt this point and the nearest island there is a passage, with from 3 to 7 and 10 fathoms, leading into the large space called Ramree Harbour; another passage leading into it from the S., is along the E. side of the chain of islands that projects from the S. point of Ramree in an S. by E. direction. The largest, and nearest to the point, is named Amherst Island, or Juggoo; the next, Adam Island; the third, Still Island; and the two S.-most, Wyndham and Harrison Islands, which are small. These islands are lined by rocks and shoal water, and an extensive shoal projects from the E. shore also nearly over to the islands, greatly contracting the channel, and rendering it unsafe to the E. of Amherst Island: the depths in it are generally irregular, from 7 to 4 or 3½ fathoms; but the best passage is between the N. end of Amherst Island and Ramree Point, and when inside of this point the depths increase; but there are several shoals in this inlet, which render it difficult navigation, and it is necessary to have a good chart to lead a vessel into Amherst Harbour, which has depths of 3½ to 4 fathoms, water, and is safe.

Winds. Although a brisk Southerly wind, with a N. current, is sometimes experienced on the coasts of Aracan and Pegu in the N.E. monsoon, the prevailing winds are from W.N.W. and N.W. in the day, and from the N. in the night, seldom veering to N.E. It may, therefore, be preferable for a ship leaving Cheduba Road or Ramree Harbour to proceed to sea by the S. Channel when the N. winds prevail, and not lose time beating to the N. and W. round the reef off the N. end of Cheduba. The S. Channel is formed by the Cheduba Flat, Round Island, and Flat and False Islands to the W., and the Ramree Chain to the E., and is continued in a S.W. direction to the S. of Tree Island, which must have a wide berth of 2 m.; it is dangerous to approach, being surrounded by straggling rocks, which extend to the S.E., also to N. and to N.W., to the distance of 1½ m.

The N.W. Point of Cheduba is a round volcanic hill, 200 ft. in height, having casuarina trees only growing on it. It is connected with the N.W. reef by a series of detached rocks, both above and below water, with deep channels between them, through one of which an entrance was found into a small, and (in the N.E. monsoon) good harbour on the N. coast of the island. This was named *Port Childers;* its harbour rock lies S.S.E. from Beacon Island, distant 1¾ m. This rock is 20 ft. high, 50 or 60 yards in length, and is the largest of the rocks in its neighbourhood. From its W. side a reef, whose extreme is above water, extends 1 m. At ¼ m. to S.S.W. of the harbour

rock, is a small rock above water, and about ¼ m. to the S. and S.E. of the latter are two sunken rocks, forming the N. limit of the entrance-channel. This channel, which runs E. and W., has 6 fathoms in its centre, 4 fathoms close to the two N. rocks, and 5 fathoms near the reef forming its S. limit. The reef, from its resemblance to the ribs of a wreck, is named Rib Reef. The channel is ½ m. wide, and the land and sea-breezes blow directly through it alternately. There is no passage for ships from Port Childers into the Cheduba Channel; but in coming out of the port to the W., a clear passage exists close to the S. of Rib Reef; but this is not recommended, and the navigator must have a good chart In entering the port, when the N.W. point of Cheduba bears S.S E., steer E.N.E. until it bears S. by W. The best anchorage will then be found with Sandy Island bearing N., in 4 fathoms, clay and mud. **Henry Rock** is a detached mass, 35 ft. high, visible 6 or 7 m., and bearing from the N.W. point of Cheduba W.S.W. 2 m. It is the largest mass off this part of the coast, and has a considerable reef surrounding it. There is a narrow channel inside, but the tides render it very dangerous. Throughout the line of coast, the safe limit of approach in ordinary navigation is 20 fathoms by day, and from 60 to 70 by night, the former clearing all the dangers about 2 m. To the W. and N. of Beacon Island, in the entrance of Cheduba Strait, the soundings extend a much greater distance off shore than to the S. of it, where at a distance less than 10 m. no bottom is found at 120 fathoms.

The W. Coast of Cheduba has small detached rocks scattered along it at the distance of less than 2 m. off shore; but these do not prevent the practicability of anchoring in various parts during the N.E. monsoon, when the coast is visited by native craft for rice. This article may be procured in quantity, cheap and good; also cattle, poultry and fruit. Wood is easily procured, but water not without trouble. There is little inducement, however, to visit this coast, and vessels not bound to its ports would do well to keep clear of it in the S.W. monsoon A range of hills runs parallel to the S.W. coast of Cheduba; the W. Hill, in lat. 18° 47′ N., is 1,300 ft. high; South Peak, near the S. extreme of the island, is 1,700 ft. in height, and may be seen beyond the limit of soundings to sea-ward. As the S. point of the island is approached, Pyramid Rock will be seen; it is a remarkable pinnacle, rising 200 ft. out of the water, and lying 1 m. from the shore: it bears about W.S.W. from South Peak. There are dangerous reefs to the S., between Pyramid Rock and Flat Island; so that when working along shore to the N. of Hill Island, the Pyramid should never be brought to bear to the N. of N. by E. The in-draft between Cheduba and Flat Island is very great.

ISLANDS to S. of CHEDUBA. Flat Island is about 4 m. long from N. to S., and is very low, except near its centre, where there is a volcanic hill about 200 ft. in height. It is separated from the S. part of Cheduba by a channel varying from 2 to 4 m. in width. Hill Island, which is small and high, lies close to the S. of it, a reef connecting them. Reguain is the native name of Flat Island. **False Island** is a small, low, sandy island, bearing from the volcano of Flat Island E. by S. 5½ m.

West Shoal is a dangerous reef, ½ m. in diameter, with very irregular soundings round it. The sea constantly breaks on it, and at L. W. the points of rocks are seen between the rollers. Rocks extend in a line between this Shoal and False Island N.N.E. 8 m.: a remarkable one, called Sail Rock, lies about 2½ m. to E. by N. from West Shoal. **Heywood Channel** (named from the late Captain Peter Heywood, R.N.) runs between the shores of Hill and Flat Islands on the W., and the reefs and rocks extending from West Shoal to False Island on the E. The course through it is N.E. by N., in from 13 to 5 fathoms, sandy bottom. There is good anchorage in moderate weather. This channel leads to and from the port of Amherst, or Ramree Harbour, and the secure anchorages inside the Islands of Cheduba and Ramree.

Tree Island, said to be named Negamale by the Burmese, in lat. 18° 26′ N., lon. 93° 56′ E., about a mile in length and 250 ft. in height, bears from Hill Island S.E. ½ S. 10½ m. A reef of straggling rocks extends from its S. point for ¾ m., and detached rocks are found off its E. shore. There is also a 4-fathom patch ½ m. from its N.W. point. This Island and West Shoal form the sea entrance to a second channel leading to the inner anchorages of Cheduba and Ramree Islands. The N.W. limit of this, called *Childers Channel,* is the range of reefs between West Shoal and False Island, and its S.E. limit is Tree Island, and a large rocky reef about 3½ m. N. by E. ½ E. Between this reef and the Sail Rock the channel is 4½ m. wide. The course through the fairway is N.N.E. in from 15 to 9 fathoms, water. The superior width and depth, and the clear approach to Tree Island, avoiding the danger of West Shoal, seem to give this channel the preference over the Heywood Channel, but for both a good chart is necessary. The tides are strong through both. Tree Island is said to have a pool of water on it.

Nerbudda Rock bears S.E. ½ E. from the centre of Tree Island 5 m. It is a small pinnacle, awash at L. W., with a small break of sea on it. Six fathoms are found close round it, and

10 fathoms within a mile To avoid it from the W., Tree Island must not be brought to bear to the W. of N. by W. There is a clear channel between it and the S. reef of Tree Island; but it is preferable to round the latter. S E. by S. about 14 m. from Tree Island is the **Four-Fathom Shoal,** an extensive coral-bank, with very irregular soundings. It bears from the Nerbudda S.S.E. 7 m., and from Foul Island, N. by W., distant 4 leagues. On either side of this bank, between it and Foul Island, or between it and Nerbudda Rock, there are safe channels, leading from the S. entrance of Cheduba Strait to sea-ward. In the N. Channel the least water is 12 fathoms, with Tree Island N.N.W. ½ W., 7 or 8 m. off. The channel to the S. of the Four-Fathom Bank is contracted by **Brougham Shoal,** on which the sea breaks, bearing N.N.E. 3½ m. from Foul Island. This shoal is a patch of rocks a mile long, having 5 fathoms alongside of it, and from 24 to 27 fathoms within a mile.

FOUL ISLAND, in lat. 18° 3′ N., lon. 94° 7′ E., is about 20 m. off the coast, and 25 m. about S.S.E. from Tree Island. It bears W. by N. from a point called Bluff Cape 7 leagues. Foul Island may be seen 8 leagues distant, and is 2 m. long, of conical form, its centre being *stated* as 500 ft. high; the N. end terminates in a low point, with a remarkable tree on it, and the whole of the Island is covered with trees; and to the N.E. of it there are islets and rocks, with a reef partly above water, stretching S. from the outer or S -most of these islets above 1 or 1½ m. Abreast this reef, the depth at 2 or 3m. distance is 20 fathoms. **Vestal Shoal** (breaking generally) bears E. by S., and is 6 m. from Foul Island. **William Shoal,** at 8 m. to E.S.E. of the Vestal, has only 2 fathoms, water, on its extremes, and from 5 to 7 between them, the shoal being a mile in length N.E. and S.W. **Satellite Rock** is *said* to lie about 4 m. to N. by E. of William Shoal.

SANDOWAY ROAD, in lat. 18° 34′ N., lon. 94° 13′ E., formed inside the reefs at the mouth of the river of this name, has anchorage from 6 to 5 fathoms; and Sandoway Town, which lies about 8 m. up the river in a S.E. direction, is a place of some consequence. The channels between the reefs leading to the road require care from strangers; there is one from the S. and another from the N., exclusive of that between Tree Island and Foul Island. About 2 leagues N. from Sandoway Road, there is a town and pagoda near the shore, opposite to which lie the Osprey and Gunga Saugor Reefs, 6 m. off shore, having soundings of 4 to 7 fathoms between them, and the same depths near the coast from thence to Sandoway Road. **Andrew Bay,** in lat. 18° 17′ N., is about 5 leagues to S. of Sandoway; it has deep water, and is partly sheltered from S.W. winds by an extensive reef stretching to the W. from the S. point of this bay; on this reef are the Thames Rocks.

Ships intending to anchor in Sandoway Road should have a good chart, as the channel from the N.W., though wide, is bounded on the W. side by False Island and Tree Island Reefs, and on the E. by the Osprey, Gunga Saugor, and other rocks. There are several peaked hills 2½ or 3 leagues inland to the N. of Sandoway River; but Sandoway Peak is close to the sea, about 2½ m. S.E from the isle and reef that bar the river's mouth, which peak bears E.S.E. from Round Island, and is an excellent mark when visible, as the line drawn between these objects leads clear *through* the channel, but near to the S. end of Gunga Saugor Rocks, which lie 4 m. W. of the anchorage: it is therefore right, after being 2½ or 3 leagues to the E.S.E. of Round Island, to keep a little outside of the direct or transit line between Round Island and Sandoway Peak, until past Gunga Saugor Rocks, then haul in E. or E. by N. for the anchorage to the N.W. of the isle and reef that front the mouth of Sandoway River.

On the main land to the S.E. of Ramree a triple ridge of regular sloping mountains, called the Yeomaloung, divides the provinces of Aracan and Pegu; their S. extremity is at the Keintalee-Khyoung, in about lat. 18° N.; the coast of Pegu extends in a S. direction from thence to Cape Negrais, forming several bays, not affording safe shelter for large ships, and having some groups of islets and dangers in its vicinity.

Soundings. When to the N. of Foul Island and Andrew Bay, the main land may be approached to 16 fathoms in coming from the S. along the coast towards Cheduba Strait. The soundings between Foul Island and the main are generally from 20 to 30 fathoms; within 4 m. of Bluff Cape there are 21 fathoms, the bottom mostly mud, although in some parts it is hard sand, about 3 leagues off shore. About 3 and 4 leagues S. from Foul Island the depths are from 38 to 46 fathoms, and to the W. of it, at a few miles' distance, they soon increase to 55 and 60 fathoms, and a little farther out there is no ground. Ships passing outside this island in the night should not come under 40 fathoms, nor under the same depth in passing outside Cheduba and the bank and islands projecting from it to the S.; about 4 or 5 leagues W. of that island the bank has a sudden declivity from 60 or 70 fathoms to no ground.

Close to William Shoal the depths are 24 and 23 fathoms, decreasing inside to 15 fathoms within a mile of Bluff Cape, which cape has a reef around it to ¾ m. distant, and a bay on its

N. side, at the bottom of which there appears the entrance of a river. A ship passing inside of William Shoal ought not to deepen above 20 fathoms towards it, nor approach Bluff Cape under 16 fathoms.*

COAST OF PEGU.

Bluff Cape, or Keintalee Point, in lat. 17° 58′ N., lon. 94° 27′ E., is just to the S. of the Keintalee-Khyoung, the river which separates the provinces of Aracan and Pegu. In lat. 17° 48′ N. there is a mountain, and 3½ m. to the S. of it a Quoin Hill, both near the coast to the N.E. of Brown Cape, which in this part has several reefs and isles projecting 2 to 3½ m. from it, and the outer extremity of the reef that surrounds **Rocky Islet** (which is to W. of Quoin Hill), in lat. 17° 44′ N., is nearly 2¾ m. distant from the nearest shore, and there is a 6-fathoms rocky patch 1 m. W. ½ S. from the outer verge of the reef. The depths near this patch on the outside are 23 and 24 fathoms, and inside, close to the reefs and isles, from 10 to 5 fathoms.

GWA, or KHWA ISLAND, in lat. 17° 33½′ N., lon. 94° 34′ E., lies 1½ m. from the shore, and is of middling height, having a coral bank extending about 3 m. to the W. of it, with irregular soundings from 18 to 8 fathoms, 22 on the outer edge, and 30 to 33 fathoms at a small distance from the verge of the bank. To the N.E. of Gwa Island there is a harbour for small vessels, at the S. part of which is the entrance of the small river, and Gwa Town, built with bamboos and mats, with a cultivated country around. From Keintalee Point to Gwa, the coast goes about S. by E. 9 leagues. Rocky Islet (to W. of which a 6-fathoms shoal is marked) lies 4 leagues to N.N.W. of Gwa Bay. Between Gwa Island and Broken Point, opposite to the Calventuras, there are several indentations in the coast fronted by reefs.

Tides. H. W., on F. and C., at 11½ h., spring rise 6 ft.

ST. JOHN, or CHURCH ROCKS, in lat. 17° 27½′ N., lon. 94° 23′ E., bear from Gwa Island S.W. by W., distant 12 m., and from the shore the same distance; they are four in number, one of them large, and about 16 ft. high, the other three small and near each other. When they bear about S.W. the large one resembles a country church with a square tower on its W. end, from which they have been named. Very near these rocks there are 20 fathoms, water, and a little distance inside, the depths are 35 and 36 fathoms, soft ground, decreasing pretty regularly towards the shore; but the latter should not be approached under 22 fathoms, if working between it and Church Rocks in the night, nor should the depth be increased above 34 fathoms towards those rocks.

The Coast between Foul Island and Church Rocks may, *in some places*, be borrowed on to 15 or 16 fathoms in working, which will be about 2 m. off shore; the depths from 2 to 4 leagues off are 26 to 40 fathoms, increasing fast to the W. of Church Rocks to no ground; therefore, a ship passing outside of them in the night should keep in deep water, not under 56 or 60 fathoms. There is a hill called Round Hill in lat. 17° 14½′ N., and another called Peak Hill in lat. 17° 10′ N., from the latter of which the land projects 2 m. in a point to the N., and **Sandy Isles,** surrounded by rocks, stretch 1½ m. to the W. of that point, having shoal soundings of 5 and 6 fathoms, rocky ground, extending 1½ m. farther. The deep bay, to the N. of the Sandy Isles, seems to afford anchorage in 6 or 7 fathoms to the N.N.E. of Peak Hill.

CALVENTURA ROCKS bear from Church Rocks S. ¼ W., distant 11 leagues; they form two divisions, bearing from each other N.W. and S.E., distant 5 or 6 m., the body of them being in lat. 16° 53′ N. The N.W. group consists of seven black rocks, in lat. 16° 55′ N., lon. 94° 15½′ E., of different magnitudes and forms; one of them resembles an old church with a mutilated spire; another is much larger at the top than at the base. The S.E. division consists of two high rocky islands, covered with trees and bushes, connected by a reef of rocks, with 5 to 7 fathoms, water, upon it, having also a single rock dry at L. W., about half way between the islands. Between the Calventura Rocks and Broken Point on the main there is a safe channel, about 4½ m. wide, with 20 and 22 fathoms, soft ground, in mid-channel, and 15 or 16 fathoms, hard sand, towards the rocks or the shore; about ¼ m. inside the E. rock, there are 6 and 8 fathoms, water. These two rocky isles bear nearly N. and S. from each other, distance 2½ m.

Broken Point, in lat. 16° 55′ N., abreast the Calventuras, forms the S. side of the Kyoung-tha River. From Kyoung-tha Town there is a road, leading over a mountain-pass to the great town of Bassein, which is only about 30 m. off in a S.E. direction. Broken Point bears about S. by W. 9 leagues from the similar projection that forms the S. side of the Baumi-Kyoung Bay.

* Heckford's "Coasting Guide," an excellent authority, says that the rocks, shoals, and islands, between Cheduba and Cape Negrais, are correctly laid down on the survey by Captain Daniel Ross, I. N.

Between them the coast projects most abreast of the Peak Hill and Sandy Isles. From Broken Point, abreast the Calventuras, a reef extends to the N.W. about 1 m., with a rock on its outer edge dry at L. W.; and to the N.E. of the point the coast forms a bight, with a small river, fronted by a high island, and contiguous reefs. About 4 m. to the N. of Broken Point, and 1½ m. off shore, there is a sandy island with trees on it, and 1¼ m. to the N.W. of the latter a remarkable Brown Rock, which is surrounded by a reef.

In passing along the coast from the Church Rocks to the S., a ship may keep between 35 and 23 fathoms, and in the latter depth she will be about 6 m. off shore. Passing betwixt the Calventuras and the main, she should not, in turning, borrow nearer to the Sandy Isles and Broken Point than 13 fathoms, which is usually about 2 or 2½ m. from the shore; and the Brown Rock Reef should not be approached under 16 fathoms; neither should the coast be borrowed on under this depth to the E. and S.E. of the S. Calventuras, as some islets and reefs lie 1½ m. off shore, where the water shoals on the verge of some of them, from 15 soft to 8 fathoms, hard at a cast. Ships which pass outside the Calventura Rocks ought to keep on the edge of soundings, and with great caution not to come under 50 or 60 fathoms in the night, which will be but a small distance from the outermost rocks, there being 44 and 46 fathoms when they bear E. about 1½ m.

The Coast from Broken Point to **Round Cape,** in lat. 16° 16′ N., a little to the S. of the Buffalo Rocks, extends S. by W. and S.S.W., having some projections and indentations, with several islets and reefs, at the distance of from 1 to 3 m. in some places, the outermost of which are the following: a bank of rocky bottom, with 6 fathoms on it, in lat. 16° 43′ N., about 3½ m. off shore, with depths of 15 and 14 fathoms near it, and 12 or 11 fathoms inside, between it and the main. **Mile-stone Rock,** above water, in lat. 16° 40′ N., 3 m. off shore, is in the stream of 15 fathoms, having several reefs 2 m. to the S., and a high isle nearly 3 m. S. by E. from the rock.

Coronge Island (the S. point) in lat. 16° 31′ N., is high, about 2 m. in length N. and S., contiguous to a rocky point of the coast, which forms a large bay to the N.E., having some rocks and islets in it, with soundings of 5 to 7 fathoms. Nga-yot-koung is a village in the bay to E. of Coronge Island. **Crawford Shoal,** in lat. 16° 29′ N., distant 3¾ m. W. ½ N. from Conical Cape, and 3¼ m. S.W. from the S. end of Coronge Island, is partly dry at L. W. spring tides, having 16 fathoms close to it on the outside, and 12 or 11 fathoms about a mile inside; but Conical Cape must be avoided, as breakers and a white rock front it, at ¾ m. and ½ m. distance.

LYCHUNE ISLANDS, in lat. 16° 23′ N., two in number, lie near each other, and 1½ m. off shore, the innermost being called Oong-chune. Reefs and rocky islets extend 2 m. to the N. of them, and the adjacent coast is lined with rocks or reefs. The depths near the outer reefs and islands are 9 and 10 fathoms irregular, with 5, 6, and 7 fathoms in some of the passages between the islands or reefs.

Saingbain Kieu, or Buffalo Rocks, in lat. 16° 19′ to 16° 22½ N., lon. 94° 12′ E., lie just to the S. of the Lychune Island, and bear nearly S. ¼ W. from the outermost Calventura Rocks, distant 10 or 11 leagues: they are a group of detached rugged rocks, extending nearly N. and S. about 3½ m., situated 2½ m. from the shore, and bearing N. from Cape Negrais. Ngan-kyoung, in lat. 16° 20′ N. (Naing-chune on the chart), is a village on a stream, abreast of these rocks. The N. Buffalo is a little more than ½ m. to the S.W. of the outer Lychune Island; and about mid-way betwixt it and the S. Buffalo, Perforated and Pillar Rocks are situated. The soundings betwixt these rocks and the N. or S. Buffalo are from 9 to 12 fathoms, and nearly the same depths continue to the edge of the shoal-bank, about a mile inside the S. Buffalo, which shoal-bank extends along the coast about 1½ m. off shore, having on it several dangers and rocks above water. In the present state of our knowledge, no vessel should go in shore of these islets and rocks. At Round Cape, in lat. 16° 15½′ N., the coast is more safe to approach, and continues so to the Brother Hills, in lat. 16° 8′ N., excepting that a rock, called **Black Rock,** in lat. 16° 11′ N., lies above water 2½ m. off shore, having 9 and 10 fathoms, water, close to it on the inside. On the W. side of the Buffalo Rocks the soundings are regular, 20 fathoms about a mile from them, and 50 or 60 fathoms at 5 leagues' distance: but they should not, without great caution, be approached in the night, nor should the coast between the Calventura Rocks and the Buffalo Rocks be borrowed on under 20 fathoms in most places, excepting during fine weather in the daytime.

CAPE NEGRAIS, in lat. 16° 1½′ N., lon. 94° 13′ E., is the S.W. land of the coast of Pegu, but the S. extremity of that coast is called **Thay-gin, or Pagoda Point,** in lat. 15° 57′ N., bearing nearly S.S.E. from the former, distant 6½ m. Very near the point there is a large rock, with a small pagoda, and red cliffs stretch from it towards Cape Negrais, which are fronted by a reef, extending 1¾ m. to the W.; this reef terminates at the N. end of the red cliffs near Cape Negrais, and should not be approached under 10 fathoms in a large ship. To the N. of the red cliffs the shore is more bold, there being from 11 to 12 fathoms, soft ground, within 2 or 3 m. of the Cape;

but between the latter and the Brother Hills, straggling rocks or reefs project 1½ m. from the shore, which should not be approached under 11 fathoms.

Bassein, or Negrais River, or Persaim River, formed between Pagoda Point to the W. and Point Porian to the S.E., is navigable a great way inland: there are two channels that lead into it, one on each side of Negrais Island, and the W. channel forms a good harbour betwixt that island and the W. side of the river. The E. channel was not so safe until its channel was buoyed; for an extensive reef projects from the land about Point Porian nearly to Diamond Island, and a reef projects also from Negrais Island about 5 m. to the S.W., which, with other detached shoal-banks, nearly join the extremity of the former reef and Diamond Island. This river was formerly a place of resort for trading-vessels from Coringah and other parts of the Coromandel coast; but since the Burmese War of 1852, it has attained an extensive European trade, and has a Master-Attendant. Rice is the principal export; teak-timber is next in importance.

Port Dalhousie, the entrance-port, about 3 m. to N.E. of Negrais Island, has proved itself a dangerous place in the S.W. monsoon, and Heckford's "Coasting Guide" advises ship-masters not to remain there longer than necessary, at the change of monsoons; nor to resort there, when outward-bound, unless ready to start at once.

Hin-gie, or Negrais Island, situated in the entrance of the river, 3½ m. inside Pagoda Point, and nearest to the W. shore, is conspicuous by a hill on it, which is the E.-most *high* land on the coast; Point Porian, on the S.E. side of the river's mouth, being the first *low* land, formed of white cliffs, and covered with trees. The whole of the coast, from the extremity of the Aracan Mountains near Cheduba to Cape Negrais, is a continued ridge of craggy land, tolerably high, broken into cliffs of reddish earth in many places, and generally with low trees or brushwood upon it, without any signs of cultivation or inhabitants towards the sea.

A ship intending to anchor under Pagoda Point should bring it to bear N.E. ½ N. or N.E. by N., then steer for it; some hard casts of 6, or perhaps 5 fathoms (towards H. W.), may be got on the *Orestes* Shoal, the tail of the sand that extends from Negrais Island, and when the point bears from N.W. to about W., about 1 m. off, she may anchor in 6 or 6½ fathoms, mud. A ship going in for the harbour or channel between the island and W. shore should round Pagoda Point at the distance of a mile in 6 or 6½ fathoms (H. W. depths), but a little inside the point the channel becomes more contracted. No vessel, drawing over 14 ft., should attempt to pass between Negrais Island and the main towards Port Dalhousie.

Diamond Island, or Lychune, in lat. 15° 51½′ N., lon. 94° 18¾′ E., bears nearly S.S.E. from Pagoda Point, distant 5¼ m., and fronting the entrance of Negrais River; it is low, covered with trees, about 1 m. in extent, and may be seen about 5 leagues; but it should not be approached in a large vessel without great caution, on account of the reefs that surround it, particularly on its S. and W. sides. The leading mark for passing to the N. of Diamond Island, is to keep the extreme point of Cape Negrais a very little open with the bluff of Pagoda Point: this will take a vessel clear between the flat extending off Porian Island and Diamond Island, but buoys are now laid down to mark the channels, as follows:—

Fairway Buoy (*Red*, with "Fairway" on it,) is placed 1½ m. to N.E. of Diamond Island.

A first-class *Red* Buoy marks the S. tip of Orestes Shoal, at 2 m. to N. of Diamond Island.

Another *Red* Buoy marks the E. edge of Orestes Shoal; and due E. from this, a *Black* Buoy marks the W. edge of Porian Shoal.

ALGUADA REEF bears from Diamond Island S.S.W. 3¼ leagues, the N. extremity of it being in lat. 15° 43′ N. It is a very dangerous reef of rocks, level with the surface of the sea, extending N. and S. about 1¼ m.; but there are detached rocks at a considerable distance from it, one with 3½ fathoms, about 1 m. S. by W. from the light-house; therefore vessels ought not to stand in under 15 fathoms when rounding it; on some of which the sea breaks in bad weather. The passage between Diamond Island and Alguada Reef is very dangerous, and ought not to be adopted in any ship, except in a case of *great* necessity. Several ships have struck upon these sunken rocks, one which was H. M. S. *Exeter;* and the ship *Travers*, bound to Bengal, was totally lost on a rock *said* to bear N.N.E. from Alguada Reef, distant ¼ m. (Travers Shoal), probably the same on which the *Exeter* struck.

Light. Alguada Reef, in lat. 15° 42½′ N., lon. 94° 14′ E., has now a splendid light-house, showing a light *revolving* every minute, elevated 144 ft. above H. W. level, visible 18 m. off. Navigators must remember the 3½-fathoms shoal which lies nearly 2 m. to S. of the light. Be careful also how the tides set the vessel.

Directions. Since the erection of Alguada Reef Light-house, the entrance of this port has little danger. Vessels, coming from the S. and W., in the S.W. monsoon, should pass about 3 m. (and not less) to the S. of the light-house. When it bears N.N.W., steer about N.N.E. to pass