THE

ST. LAWRENCE PILOT,

COMPRISING SAILING DIRECTIONS FOR THE GULF AND RIVER;

BY

REAR-ADMIRAL H. W. BAYFIELD, F.R.A.S.

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TO THE FOURTH EDITION.

THE St. Lawrence Pilot, Vol. II., contains Sailing Directions for the southern parts of the Gulf of St. Lawrence, and for its south entrance, through Chedabucto bay and the Gut of Canso.

In the first four Chapters a description is given of the coasts of New Brunswick and Nova Scotia, including Chaleur and Miramichi bays, and the southern shore of Northumberland Strait. Chapters XVII., XVIII., and XIX. describe the shores of Prince Edward island and the north-west coast of Cape Breton island, and give directions for navigating Northumberland Strait.

In Chapter XX. will be found directions for the Gut of Canso and the Lennox Passage; and in Chapters XXI., XXII., and XXIII. a description of Chedabucto bay, the eastern coasts of Cape Breton island, and the Bras d'or Lake.

I. W.

Hydrographic Office, Admiralty, London,
June 1860.

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IN THIS WORK THE BEARINGS ARE ALL MAGNETIC, EXCEPT WHERE MARKED AS TRUE.

THE DISTANCES ARE EXPRESSED IN SEA MILES OF 60 TO A DEGREE OF LATITUDE.

A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO 100 FATHOMS.

THE DEPTHS ARE IN FATHOMS OR FEET REDUCED TO LOW WATER OF ORDINARY SPRING TIDES.

THE

ST. LAWRENCE PILOT.

PART III.

CHAPTER XIII.

GULF OF ST. LAWRENCE ; WEST COAST,—CHALEUR BAY.

VARIATION 22¾° W. in 1860.

CHALEUR BAY, on the western shore of the Gulf of St. Lawrence, is the largest bay in the Gulf, being 25 miles wide, on a S.W. ¼ S. line across its entrance, from Cape Despair to Miscou island ; but the entrance is more generally considered to be at Macquereau point, from which the north point of Miscou island bears S.S.E., and is distant 14½ miles. The depth of the bay, from Miscou to the entrance of the Ristigouche river, is about 75 miles, and its circumference, from Cape Despair round to Miscou, is 185 miles.*

The northern or Canadian shore of the bay is of moderate height, but an irregular range of hills, of considerable elevation, is everywhere visible a few miles back from the coast, the predominating features of which are red cliffs of sandstone and shale, with intervening shingle and sand beaches. Trap rocks and limestone are occasionally met with also, but more sparingly. The southern or New Brunswick shore is, generally speaking, much lower, and for the most part composed of similar rocks ; but between Bathurst and Caraquette the cliffs of red sandstone rise to the height of 200 feet above the sea. The sandstone either belongs to, or is very nearly connected with, the coal formation, fossil vegetable remains of which, as well as thin veins of bituminous coal, being not unfrequently met with.

* *See* Charts :—Gulf of St. Lawrence, General Chart, No. 2,516 ; scale, $d = 3{\cdot}7$ inches : and Chaleur Bay, with Plans of Paspebiac, and Dalhousie Bays, and Heron Island, No. 1,715 ; scale, $m = 0{\cdot}25$ of an inch.

There are increasing settlements all around the bay, and several harbours, roadsteads, and rivers, which are frequented by numerous vessels engaged in the lumber trade and the fisheries.

The climate is warmer, and the weather in general much finer, within this bay, than it is outside in the adjacent parts of the Gulf. The fogs, which prevail so much with southerly winds on the Miscou banks, seldom enter the bay, although rain and mist accompany easterly gales here as elsewhere.

The navigation is by no means difficult ; for although there are some dangerous shoals, yet there is everywhere good warning by the lead.

TIDES.—It is high water, full and change, in the entrance of Chaleur bay at 2h., and ordinary springs rise 5 feet and neaps 3 feet. The tidal streams are regular within the bay, and seldom amount to the rate of one knot per hour ; but outside, off its mouth, and especially on the Miscou banks, the currents and tidal streams are so irregular, both in strength and direction, that nothing definite can be said of them ; and their dangerous effects upon the course of vessels can only be guarded against by the constant use of the deep-sea lead, and attention to the soundings.

DIRECTIONS at NIGHT and in FOGS.—Vessels bound for Chaleur bay, and approaching its entrance in a dark night or foggy weather, should not attempt to make Macquereau point, which is so bold that there is little or no warning by the lead ; but should strike soundings on the Miscou banks, which extend nearly 22 miles to the eastward of Miscou island. A cautious look-out should be kept for the numerous fishing schooners, which are generally riding on the banks ; and the northern edge of the latter, being followed in 30 fathoms water, will safely conduct vessels past the north point of Miscou, at the distance of 4 miles, and form a sure guide up the bay. In addition to the soundings, there is the assistance of the lighthouse on Birch point, Miscou island ; it is an octagon, wooden, and red tower, 74 feet high, and shows a *fixed red* light, 79 feet above the sea (page 23).

The bank of soundings off the north shore is also sufficiently wide to guide vessels everywhere within Macquereau point ; nevertheless, in a dark night and bad weather, vessels had better not approach the shore much nearer than the depth of 30 fathoms in any part of the bay to the eastward of Carlisle point. The soundings are generally of sand and shells on the banks, while in the central parts of the bay black and brown mud prevail, with depths between 30 and 50 fathoms. Within, or to the westward of Carlisle point, and the opposite bay of Nipisighit, the depth decreases to less than 30 fathoms, but there is still sufficient warning everywhere by the lead quite up to the head of the bay.

CAPE DESPAIR, and the Leander shoal, which lies off it, have been described in page 82, vol. 1. The course from that cape to Macquereau point is W. by S., and the distance 23 miles. In the bay between them are Grand river, Little Pabou, Great Pabou, and Newport.

GRAND RIVER, 7 miles westward of Cape Despair, is a considerable stream, but has only 2 feet at low water over its bar. There is a village and a considerable fishing establishment there ; and immediately to the westward of the river a shoal extends fully half a mile out from the shore.

LITTLE and GREAT PABOU are fishing-places, fit only for boats or very small craft. There is but a foot of water over the bar of the former at low tide, and ordinary springs do not rise over 5 feet. Great Pabou, which is a similar, but much larger place, had 5 feet over its bar at low water when it was surveyed, but the depth and situation of the very narrow channel change with easterly gales.

NEWPORT, situated S.W. $3\frac{1}{2}$ miles from Great Pabou, and 6 miles N.E. of Macquereau point, is another fishing-place, where a small vessel or two may be moored, (under shelter of a shoal, and at some risk,) to take in fish during the summer months.

MACQUEREAU POINT is of bold and dark-coloured craggy rocks. It is also wooded, and rises to about 200 feet above the sea.

PORT DANIEL, 7 miles west of Macquereau point, is a fine bay, open to the eastward, and about $1\frac{1}{2}$ miles wide and deep. In the northern corner of the bay, half a mile within White point, which is high and of white limestone, a small river enters the bay through a sandy beach, after descending a beautiful valley between wooded hills. There are many houses and stores near the entrance of the river, which will only admit boats at high water, being nearly dry when the tide is out.

A shoal extends half a mile from the shore all around the port south-westward from White point to West point. West point is of craggy gray limestone, with a high and remarkable semi-isolated rock at its south-east extremity. It is the south-west point of the port, and bears S. $\frac{3}{4}$ W., 2 miles from the river's mouth ; on its north side there is a small cove, and a good landing for boats. Daniel hill, about one mile to the westward of West point, and rising 400 feet above the sea, is remarkable as the highest land close to the shore on this part of the coast. It serves to point out the situation of Port Daniel, as does also Red point, which often appears like an island close to the shore.

Supplies of wood and water may be obtained at Port Daniel, but fresh provisions are not plentiful.

The points in order westward from Macquereau point, and between it and the river, are Red point, Pillar point, and White point, which will all be easily recognized; the first and last by their colour, and the other by a remarkable rock close off its extremity. The ground is not good outside the line joining Pillar and West points. The best anchorage in Port Daniel is in 6 or 7 fathoms, mud or clay bottom, in the line between White and West points, with the entrance of the river N. $\frac{1}{4}$ W., and Red point and Macquereau point in one bearing E. $\frac{3}{4}$ S. The shelter will then be from East, round north and west, to S.S.W., and in winds from between these points this bay affords safe and convenient anchorage. Strong south-east winds roll in a heavy swell, but there is no difficulty in getting out on their approach, for the points are all bold, and in standing out or in vessels may safely pass West point at the distance of 2 cables.

NOUVELLE RIVER, 9 miles westward of Port Daniel, has only 2 feet over its bar at low water, and will be known by the fish stores and stages on the sandy beach on the east side of its entrance. The western side is formed by Nouvelle point, which is a high cliff of red sandstone.

PASPEBIAC BAY.—Paspebiac, $5\frac{1}{2}$ miles westward of the Nouvelle river, and $21\frac{3}{4}$ miles W. by S. from Macquereau point, has an excellent roadstead, and is the principal fishing establishment in Chaleur bay. A triangular point of sand and shingle beach, inclosing a lagoon, extends out from the mainland to the distance of a mile, and has on its west side the extensive white buildings of the establishment of Messrs. Robin and Co., of Jersey, together with numerous huts belonging to the fishermen. On the west side of the sandy point, and close to the cliffs, the lagoon has an outlet, which has a rough bridge across it, and will admit boats at high water. In rear of this, the mainland rises gently from the edge of dark red sandstone cliffs, displaying fields of the richest green, and buildings, which, although straggling along the coast, are yet so numerous as to deserve the name of a town. There are two churches; both are small, and of wood.

Carlisle, or New Carlisle, the county town, is $3\frac{1}{2}$ miles to the westward of Paspebiac, and its jail and court-house, standing on the ridge in rear of Carlisle point, are seen from the anchorage. Carlisle point, which is wooded, and consists of sand, bears W. by N., $3\frac{1}{2}$ miles from the sandy point of Paspebiac, and the roadstead is between them, but much nearer the latter. In this excellent and convenient anchorage vessels are sheltered from West, round north and east, to S.E.; and although it is completely open to the south-west winds, which send in a very considerable swell, yet the ground is so good that the Jersey vessels ride here moored all through the season without accident. The best anchorage is in 6 fathoms, clay bottom, with Robin's flag-staff and Single Tree point (the

extreme to the eastward seen over the sandy point) in one, bearing East and the extremity of the sandy point S.E. A sandy spit extends under water rather more than half a mile to the westward from the sandy point, and nearly as far to the southward likewise. This assists in sheltering the roadstead, and is the only danger to be avoided in approaching it.

Supplies.—At Pasbebiac there is an excellent watering place at a stream which will be seen falling from the cliffs just to the westward of the outlet of the lagoon. Supplies of all kinds may be obtained here, but to a limited extent.

DIRECTIONS.—In running along the land from the eastward, the low sandy point of Paspebiac, with its white stores and numerous huts, will be seen stretching out from the mainland to the southward. When the vessel has passed Nouvelle river, and is approaching within 2 or 3 miles of the point, keep the summit of Daniel hill open to the southward of Nouvelle point, until the easternmost church opens to the westward of the south extremity of the sandy point, bearing N. by E. $\frac{3}{4}$ E. Then haul up for Carlisle point, with the lead going, till the above church and Robin's flag-staff (at his northernmost large white store), come in line bearing N.E. $\frac{1}{4}$ N. Haul in now boldly for the anchorage, only taking care not to open the same church out to the eastward of the flag-staff until Single Tree point (the extreme to the eastward) is well shut in behind the sandy point, when the vessel will be within the spit, and a berth may be chosen by the lead at or near the position already pointed out.

There is nothing in the way when approaching this anchorage from the westward, but in standing out from it with a westerly wind, and especially with a lee tide, the marks for clearing the spit to the westward must be carefully attended to. The above church should not be opened out to the eastward of Robin's flag-staff until Single Tree point is well open to the southward of the sandy point; nor should the vessel bear up to the eastward of South before Daniel hill comes open to the southward of Nouvelle point.

BONAVENTURE POINT, 5 miles westward of Carlisle point, is formed by a low red sandstone cliff, with a thin superstratum of sand and clay containing tertiary shells. The Bonaventure river, with only 2 feet over its bar at low water, together with the village and church of the same name, will be seen in the bay, 2 or 3 miles to the northward of the point. A rocky shoal extends off this point to the westward fully a mile, and continues round the bay to the northward and westward nearly to Red point, a distance of 7 or 8 miles.

In the bay between Red and Black points, and 5 miles to the N.W. of the former, is the small river Caplin, remarkable only for a reef which lies off its mouth half mile from the shore.

ANCHORAGE.—There is good anchorage under Bonaventure point, with easterly winds, in 6 fathoms, mud bottom, with the point bearing S.E. ½ S., the church N.E. ½ E., and the entrance of the river E. ½ N., 1¼ miles.

CASCAPEDIAC BAY, situated on the northern side, and near the head of Chaleur bay, is of considerable extent, being 13 miles wide, and 5 or 6 miles deep. At its head is the Cascapediac river, a considerable stream, but which can only be entered by boats, in consequence of the extensive shoals of sand and mud, which dry out 2 miles from its entrance, and occupy all the head of the bay. Black point, bold and rocky, and rising 400 feet above the sea, is the eastern point of the bay, bearing from Bonaventure point N.W., 16 miles. The shoals commence about 1½ miles to the northward of Black point, and at Indian point, on the east side of Little river, they extend out to the westward nearly 1¾ miles, sheltering the anchorage from south-east winds.

Duthie point the east point of entrance of the Cascapediac river, bears N.N.W. ½ W., 5 miles from Black point. One mile to the eastward of Duthie point, and in the bay, between it and Little river, stand the church and village of Richmond.

The settlements on the western side of the bay are mostly of French Canadians and Acadians, and they extend along-shore all the way from the river to Tracadigash point, which is the west point of the bay. In rear of the settlements, the Carleton mountain range will be seen 2 or 3 miles back from the shore.

The anchorage in Cascapediac bay, where the timber ships moor in 3 fathoms, is off Richmond village, with Duthie point, bearing North three-quarters of a mile, the church N.E. by E., and Black point S.E. by S. Vessels may anchor farther out in 4, 5, or 6 fathoms, on the same line of bearing from the church, or to the westward of it, but they will not be then so well sheltered from easterly winds.

DIRECTIONS.—In running for this anchorage from the eastward observe that the marks for the south-western, or outer edge of the shoal off Indian point, (already mentioned as sheltering the anchorage from south-east winds) are, Red point a little open to the southward of Black point, bearing S.E. ¼ E. Keep these marks therefore well open, as the vessel runs to the westward with the lead going, and go no nearer the shoal than the depth of 5 or 4 fathoms, until the church bears N.E. by E. Then haul boldly in, steering directly for the church until the vessel is at the anchorage already pointed out.

CARLETON ROAD.—This name has been given to an excellent and capacious anchorage safe in all winds. It is situated on the west side of Tracadigash point, which consists of sand, inclosing a shallow lagoon, capable of admitting boats, or very small craft, at high water. On the

northern shore of this lagoon stands the church and village of Carleton, the latter extending to the westward to the shore of the bay where the sand beach of the lagoon joins the mainland. A small stream, with a bridge across it, there enters the north-west corner of the lagoon; and one mile farther to the westward, near the commencement of the clay cliffs, another small stream will be seen, which is the watering place. Immediately in rear of the village, the Carleton mountain rises abruptly to the height of 1,830 feet above the level of the sea,—the hills of the range trending from it both to the northward and westward for many miles.

Vessels may choose their berth for anchoring anywhere in from 5 to 6 fathoms, remembering that although the sandy beach of Tracadigash point is quite bold on the west side within the spit, yet shoal water extends off the mainland to the distance of nearly half a mile. The best berth, especially with easterly winds, is in $5\frac{1}{2}$ fathoms, mud, with Tracadigash point bearing S. by E. $\frac{1}{4}$ E.; Carleton steeple E. by S.; and the watering place N. by W. $\frac{1}{4}$ W.

The tides are weak in Carleton road, seldom exceeding one knot. Maguacha point, of red sandstone cliffs, is the north-east point of entrance of the river Ristigouche, and bears from Tracadigash point W. by N. $6\frac{1}{2}$ miles. In the north-west corner of the bay between them is Nouvelle basin and river, nearly dry at low water.

DIRECTIONS.—Tracadigash spit, of sand, and running out half a mile to the south-west from the sandy point of the same name, is the only danger in the way when approaching the anchorage in Carleton road from the eastward. Observe that Maguacha point and the summit of Dalhousie mountain in line, bearing W. by N. $\frac{1}{2}$ N., pass the extremity of the spit in 3 fathoms. Therefore, to clear it keep the mountain well open, or at night go no nearer than 10 or 9 fathoms water. As soon as Carleton steeple comes in line with the south-west extreme of Tracadigash point, bearing N.E. by E., the spit will have been passed, and the vessel may haul in to the northward, going no nearer than 7 fathoms till the point bears to the southward of East.

HERON ISLAND and CHANNEL.—Heron island, at $5\frac{1}{4}$ miles to the S.W. from Tracadigash point, is of moderate height, wooded, and with red sandstone cliffs at both its north-west and south-east points. Shoal water extends off both those points to the distance of three-quarters of a mile; as it does also all along the northern side of the island, where the 3-fathoms line of soundings is half a mile out from the shore. The island is 4 miles long, parallel to the coast, and there is good anchorage in the channel between it and the mainland; but the channel is rendered narrow and difficult by shoals, which extend a great distance out on either side.

At the western end the channel is only 2 cables wide, with 3 fathoms water in it. It becomes wider to the eastward, and the depths are 4 and 5 fathoms; but there the dangerous Heron rock lies nearly in mid-channel, and consequently right in the way of vessels. When on this small rock, which has 6 feet least water, and 4 or 5 fathoms all around it, the south-east extreme of Heron island bears E.N.E. one mile; the nearest sandy south point of Heron island, North, 6 cables; Beaver point S.W. $\frac{1}{4}$ S., half a mile; and a rock lying 3 cables north of Beaver point, and almost always above water, W. $\frac{1}{4}$ S., $3\frac{1}{2}$ cables. This latter rock, which lies on the edge of the shoal off the mainland, is quite bold; and a vessel, by sailing within the distance of one or two cables of it, will pass to the southward of the Heron rock; as she will also to the northward, by running along the southern edge of the shoal off the island, in 3 fathoms at low water. But this is an intricate and dangerous channel for a vessel of any size, and requires the aid of a good pilot.

ANCHORAGE.—Vessels occasionally anchor, for the purpose of loading with timber, in the bay of Nash river, in 4 fathoms, mud bottom, where they are much exposed to easterly winds, but the ground is so good that they ride safely during the summer months. At this anchorage the east point of Heron island bears N. by W., $2\frac{1}{2}$ miles; and Black point N.W., a mile.

Two miles to the eastward of this anchorage, $3\frac{1}{2}$ miles S.E. of Heron island, and $1\frac{1}{2}$ miles North of Fowler point, there is a ledge of rocks which had better be avoided; for although no less than $4\frac{1}{2}$ fathoms was found on it, yet it is possible that there may be less water. The shoal water extends off Fowler point a mile out to the 3-fathoms line of soundings. There is also good anchorage in 4 fathoms, mud bottom, to the westward of Heron island, and nearly midway between it and the river Charlo. This river will only admit boats, and its entrance bears West $3\frac{1}{4}$ miles from the north-west point of the island.

RISTIGOUCHE RIVER, from its entrance at Maguacha point, to where islands, shallows, and rapids terminate the navigation for all but canoes or bateaux, is an estuary or inlet of the sea, varying in breadth, for the first 17 miles, from $1\frac{1}{2}$ to 3 miles. At that distance Campbell-town is situated on the southern or New Brunswick shore, and at the foot of a remarkable conical mountain, called the Sugar Loaf. Between Campbell-town and Indian point, on the northern shore, where the Micmac Indians have a settlement, the breadth of the estuary is only half a mile; but it expands again to $1\frac{1}{2}$ miles at its head, just below the islands. At Indian point, a mile above Campbell-town, the navigation for shipping ends, there being only 12 feet in a narrow channel at low water; but small craft may ascend through very narrow passages, on

either side, carrying from 6 to 9 feet water, to within three-quarters of a mile of the head of the estuary ; where the Ristigouche river, properly so called, enters it through narrow channels between the islands, 21 miles from the head of Chaleur bay.

Off Loup river, which enters a bay from the northern shore 2 miles below Campbell-town, there is a shallow part of the channel called the bar, over which there is not more than 13 or 14 feet at low water ; but the tide, which rises from 6 to 9 feet, enables vessels of moderate draught to ascend to Campbell-town, off which they may moor in from 3 to $3\frac{1}{2}$ fathoms at low water. Vessels of about 18 feet draught may ascend at all times of the tide nearly to Oak point, which is about 14 miles up, and within a mile of the bar ; and ships of the line might proceed 10 miles up, or nearly to Guarde point, with the assistance of buoys and a good pilot. The Admiralty charts, and the directions about to be given, will enable the intelligent seaman to take his vessel in as far as Dalhousie harbour, or the anchorage off Fleurant point ; but, to proceed farther up, the services of a pilot should be engaged, for there are no good leading marks beyond the above places, where the shoals become too steep for the lead to give sufficient warning, and the channels too narrow for a large ship.

The most convenient anchorage for men-of-war, or other vessels visiting the Ristigouche for supplies of wood or water, is off Fleurant point on the Canadian shore, and about 2 miles to the northward of the harbour. There a vessel can weigh in all winds, and at all times of tide ; and no other directions are necessary than to anchor anywhere off the point in 6 or 7 fathoms at low water. There is a tolerably good watering place at a brook half a mile to the westward of the point, and a little farther westward the Mussel bank, a dangerous reef, extends out from the high cliffs, nearly half way across the estuary.

Every channel and settlement near the shores, every mountain, cliff, and tributary stream, will be found so correctly represented in the Admiralty chart, as to render any particular written description as unnecessary, as it would probably be inadequate to convey a just conception of the scenery of the valley of the Ristigouche, which for grandeur and picturesque beauty may advantageously compare with any other part of the Gulf of St. Lawrence. Generally, however, it may be useful to remark, that on the northern or Canadian side the settlements are not numerous, and that the mountains rise to heights varying from 1,000 to 1,745 feet above the sea, at the distance of only 2 or 3 miles from the shore. On the southern or New Brunswick side of the valley the wooded hills or ridges are much lower, although still of considerable elevation, the highest points being the Sugar Loaf, 950 feet, and Dalhousie hill, 715 feet above the sea. The settlements are increasing fast on this side ; as are also the

towns of Dalhousie and Campbell-town, where many vessels load annually with lumber. The Ristigouche offers a tempting field for the researches of the geologist and mineralogist. There are magnificent cliffs, 200 feet high, of variegated sandstones and conglomerates. The sandstones and shales often contain vegetable remains and traces of coal. Limestones, sometimes curiously altered by trap rocks, at others abounding with organic remains, are occasionally met with; and there are amygdaloidal trap rocks, abounding with zoolites, jaspers, cornelians, and agates. These last named minerals, together with fragments of petrified wood, are found among the pebbles of the beaches more or less all over Chaleur bay and especially at Paspebiac. They are known by the name of Gaspé pebbles at Quebec, where they are worked up into ornamental articles of jewellery.

BONAMI ROCKS.—The entrance of the Ristigouche river, between Maguacha point and the Bonami rocks, is nearly 2 miles wide. The rocks bear W. $\frac{1}{2}$ N. from the point; they are steep and high, and so rough and broken, that a stranger would be led to expect danger on their side instead of on the opposite, where the steep red cliffs of Maguacha point give the usual, although in this case deceptive, indications of a clear channel.

The extreme point of the Bonami rocks may be safely passed within the distance of 2 cables; but shallow water extends from the rocks to Bonami point, from which a reef runs a quarter of a mile, and the shoal continues from it to Dalhousie island.

MAGUACHA SPIT, of sand and stones with only 6 feet at low water, runs out nearly a mile to the west from Maguacha point, or towards the Bonami rocks, thus occupying fully half the channel. To clear the south-west extreme of this steep and dangerous spit, keep the highest summit of the Scaumenac mountains open to the south-west of Dalhousie island; for the summit of the mountain, and the south side of the island in one, bearing N.W. $\frac{1}{4}$ W., lead over the extreme end of the spit in $3\frac{1}{2}$ fathoms. The eastern side of the spit will be avoided by not entirely shutting in the south extreme of the Carleton mountains behind the east side of Maguacha point.

DALHOUSIE HARBOUR.—Dalhousie island, 2 cables long, is high and rocky, round-backed, and wooded, and joined by a shoal which dries to the low point of Dalhousie. On that point there are large storehouses belonging to the town of Dalhousie, which with its church, will be seen beautifully situated on the side of a hill to the south-west of the island. Three cables to the westward of Dalhousie island there is a small rocky islet, at the extremity of a narrow sandy spit, forming the western side of

the small and shallow bay of Dalhousie. The shallow water extends from the islet to the island, and the timber ships lie moored along its edge, in 6 or 7 fathoms muddy bottom, directly off the town. This is Dalhousie harbour, which is quite secure in all winds.

Dalhousie harbour may be approached in two ways, either through the direct but narrow channel between the middle ground and Dalhousie island, or round to the northward and westward of the Middle ground; which last, although it involves the necessity of passing over a flat of 3 fathoms at low water, is the route usually taken, because of there being plenty of room there, whereas the channel first mentioned is only $1\frac{1}{2}$ cables wide. The narrow channel has, however, the advantage of good leading marks, and carries 6 fathoms water.

The Middle ground, separated from Dalhousie island by the narrow channel just mentioned, is $5\frac{1}{2}$ cables long, in a N.N.E. direction, and 4 cables wide. It consists of sand and stones, with 6 feet least water; and is very steep on its eastern side, where a *buoy* is placed near its north-east point. There are no sufficient leading marks, but beacons might be easily so placed on the shore as to clear it on every side. The main channel between this shoal and the Canadian shore to the northward and eastward is more than three-quarters of a mile wide, and in some places there are 15 fathoms water. The rate of the tide, which is stronger there than elsewhere, does not exceed 2 knots.

DIRECTIONS.—To enter the river Ristigouche and Dalhousie harbour with a leading wind,—being midway between Heron island and Tracadigash point, steer for Dalhousie mountain, or about W.N.W. When within a mile or two of Maguacha point, bring the marks on for clearing the Maguacha spit; namely, the highest summit of the Scaumenac mountains open to the south-west of Dalhousie island. Stand in upon these marks until the depths are 9 or 8 fathoms on the new Brunswick shore, which will be when the Bonami rocks bear about S.W., and are distant about half a mile. Then haul to the northward, so as to keep in that depth until Lalime point (the extreme point to the westward on the New Brunswick shore) comes just open to the northward of Dalhousie island and of the islet and rocks to the westward of it, bearing W. by N. Then, if wishing to enter the harbour by the narrow channel to the southward of the Middle ground, steer W. by N. upon those leading marks until near Dalhousie island, which leave to the southward at a distance of half a cable or a cable's length, and the vessel will pass safely into the harbour.

If wishing to take the more roomy route to the northward of the Middle ground, instead of steering W. by N. for Lalime point, as soon as it opens to the northward of the island (just described), sheer over to the north-east until the soundings are 8 fathoms on the

Canadian shore, and follow that depth round to the northward and westward until Dalhousie church opens out to the westward of the island bearing S.W. by S. Then steer West, or directly up the estuary, until Dalhousie church appears midway between Dalhousie island and the islet to the westward of it, bearing S. by W. Steer now for the church, taking care not to bring it to bear to the westward of S. by W., and the vessel will pass over the extensive 3-fathoms flat, to the westward of the Middle ground, into the harbour.

With beating winds, in the board to the northward, towards Tracadigash spit, that danger will be avoided by keeping Dalhousie mountain open to the southward of Maguacha point. To the westward of the spit vessels may stand in to 6 fathoms water, but there will be no use in standing in to Carleton or Nouvelle bay out of the strength of the tide. On the Heron island side, observe that the highest summit of the Scaumenac mountains and the southern side of Dalhousie island touching, clear the shoal water to the northward of Heron island in 4 fathoms. Tack therefore in the board to the southward when the mountain comes in one with the northern side of the island, or by the lead in 6 fathoms. The vessel will be clear of the reef off the west end of Heron island when the river Charlo bears to the southward of S.S.W. ; and may then stand to the southward into 4 fathoms, as long as the east side of Maguacha point does not bear to the eastward of N.E. by N. ; after which she should tack in the board to the southward in 7 fathoms, because the flat of from $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms in Eel bay becomes rather steep as she approaches the Bonami rocks.

The Bonami rocks may be approached to 7 fathoms water, and when they bear W. by S., the vessel will be within the point of the Maguacha spit, which must be avoided by means of the leading marks already given. From the Bonami rocks to Dalhousie island she may stand in on the board to the south-west into 8 fathoms, but she should go no nearer to the east side of the Middle ground than 10 fathoms, and that with great care, for it is very steep ; its northern side may be approached to 9 fathoms. On the board towards the Canadian shore she may stand in to 9 fathoms between Maguacha spit and Yacta point, which last, observe, has a very steep shoal off it to the distance of 3 cables. To the north-west of Yacta point she can safely stand to the northward into 6 fathoms all the way to Fleurant point.

TIDES.—In Dalhousie harbour it is high water, full and change, at 3h. 10m., and ordinary springs rise $8\frac{1}{2}$ feet, and neaps 6 feet. The rate of the tidal streams in the entrance does not exceed 2 knots.

BELLEDUNE POINT, on the southern side of Chaleur bay, bears S.E. 13 miles from Heron island, and the extreme seen from it, is low and

sandy, and has shoal water off it to the eastward three-quarters of a mile. At 8 miles to the southward of this point, on the western shore of Nipisighit bay, is the church and village of Rochette; and $8\frac{3}{4}$ miles farther in the same direction is the entrance of the Nipisighit river at the head of the bay. The whole of this coast is low, and composed of sandstone, limestone, and trap rocks. The shoal water generally extends to half a mile from the shore; and vessels of large draught had better not stand nearer than the depth of 10 fathoms, especially at night, unless it be in the head of the bay, where they may safely approach the sandy beach to 7 or 6 fathoms.

BATHURST HARBOUR, at the mouth of the Nipisighit river, is 2 cables wide at the entrance between Alston and Carron points, which are of sand, with several stores and other buildings upon them. On Carron point, which is on the south-east side, there are two beacons, which, if kept in one, bearing S.W. $\frac{1}{4}$ S., will lead in through the narrow channel over the bar in 7 feet at low water, or in 14 feet at high water in the best spring tides. The distance from the outside of the bar in 3 fathoms to the entrance of the river is $1\frac{1}{2}$ miles; and for the whole of that distance the very narrow channel is between sandy shoals, nearly dry at low water, and extending from either side of the river's mouth.

In the entrance between the sandy points, or rather just outside it, there are 3 and 4 fathoms water; and here vessels usually moor to take in timber, sheltered by the bar and the sandy shoals on either side. Some of the smaller vessels load within the entrance; and some of the larger ones complete their loading outside the bar, where the anchorage, in 6 or 7 fathoms, muddy bottom, is considered safe in the summer months, although the north-east gales send in a heavy sea. Within the entrance there is an extensive and well sheltered basin, nearly 3 miles long and 2 miles wide, but nearly all dry at low water, excepting the channels of the four rivers, which, after uniting their streams below Bathurst, flow through it to the entrance, forming by their junction what is called the Main channel. On the eastern side of the basin there is an islet called Indian or Bathurst island. The town of Bathurst is well situated at the head of the basin, $2\frac{1}{2}$ miles within the entrance, and on the point of land which divides the river Nipisighit from the Middle and North rivers.

Half a mile to the westward of the town, and across the mouth of the Middle and North rivers, is Peter point with its church and village of Acadian French, and on the north side of that point the Teteagouche river enters a bay on the north-west side of the basin. These streams are all unnavigable for any distance; even the Nipisighit, which is by far the largest, and a very considerable river, ceases to be navigable $1\frac{1}{2}$ miles above Bathurst, where the tide ends, and rapids begin.

PILOTS.—There are good pilots for the river Nipisighit, and no one should attempt the bar without one, excepting in case of necessity.

TIDES.—The time of high water, full and change, at Bathurst is $3\frac{1}{4}$ h., and ordinary springs rise 7 feet, and neaps 4 feet. A depth of 14 feet at high water in spring tides can be carried up to the wharves of the town, and in the main channel there are several places where vessels may lie afloat and load in 14 feet at low water. The rate of the tides in the main channel is about 2 knots, and over the bar about $1\frac{1}{2}$ knots. The stream sets fair in and out and over the bar.

NORTON SHOAL, carrying 3 fathoms water, and lying three-quarters of a mile off shore, one mile to the westward of Norton point, and 9 miles eastward of the Nipisighit, is the only danger in the way of vessels along the coast from Bathurst harbour to Mizzenette point, a distance of 29 miles.

The coast, which for the most part is of high sandstone cliffs, becomes very low towards Mizzenette point; and about 3 miles to the westward of that point, where the sandy cliffs end, the shoal water extends to half a mile from the shore; but in general it does not extend to more than half that distance, and the coast may everywhere be approached by the lead to 10 or 12 fathoms with care, the greater depth being quite near enough at night-time. There are settlements all along the coast, and villages and fishing establishments at Great Anse and Pokeshaw. Great Anse, where there is a church, is 8 miles, and Pokeshaw 11 miles, westward of Mizzenette point. There are small bays at both places where boats find shelter, and a small river at Pokeshaw.

CARAQUETTE ISLAND lies E.S.E. nearly 3 miles from Mizzenette point, the western point of Caraquette bay. There is no passage between them for shipping; only a narrow channel for boats, or very small schooners, on the side next the island. The island is of sandstone, low and wooded, and $1\frac{3}{4}$ miles long in a direction nearly parallel to the coast. Sandy points extend from both ends of the island towards the mainland, or to the southward, so as to form a bay, in which there is landlocked anchorage for vessels not drawing more than 15 feet water. The island rises from an extensive bank of flat sandstone, partially covered with sand, and which, commencing at Mizzenette point, extends to the eastward parallel to the coast all the way to the entrance of Shippigan sound, a distance of 8 or 9 miles.*

CARAQUETTE SHOAL is that part of the bank just mentioned which extends $4\frac{1}{4}$ miles to the eastward of the island, from which it dries out

* *See* Plan of Caraquette, Shippigan, and Miscou Harbours, No. 2,686; scale, $m = 1\frac{1}{2}$ inches.

occasionally in very low tides to the distance of 2 miles, and is shallow in every part. From its east end, Caraquette steeple and the south-east extreme of the trees of Caraquette island are in line, bearing W. $\frac{1}{4}$ S.; and Shippigan steeple and Pokesuedie point bearing S. $\frac{1}{4}$ W. The last-named marks in line lead to the eastward of this shoal in 3 fathoms at low water; but a large ship, requiring a great depth of water, would have to pass farther to the eastward by keeping Marcelle and Pokesuedie points in one, bearing S.S.W.

MIZZENETTE LEDGE of rocks, with 5 feet least water, lies on the western part of the same bank, and near its northern edge. It bears N.N.W. $1\frac{1}{4}$ miles from the west end of Caraquette island, and a vessel will pass to the northward of it, in $3\frac{1}{2}$ fathoms, by keeping Donax point just open to the northward of Mizzenette point, bearing W. by N. $\frac{1}{2}$ N. These marks will also lead to the eastward along the northern edge of the Caraquette shoal until they strike Scollop patch, which has 16 feet least water over a rocky bottom; and on which the north-west extreme of Caraquette island and Caraquette steeple are in line, the south-east extreme of the island bearing S.S.W. $\frac{1}{2}$ W., distant nearly 2 miles. The marks for clearing the northern edge of the Caraquette shoal, to the eastward of Scollop patch, and in 3 fathoms water, are the south extreme of Miscou island kept plainly open to the northward of the north point of Shippigan island, bearing E. $\frac{3}{4}$ S. But those marks are low and distant, and often not well defined, therefore they should not be trusted alone, neither will they be required if the northern edge of the shoal be not approached nearer than the depth of 4 fathoms at low water.

FISHERMAN LEDGE is a detached bed of rocks, with 10 feet least water, lying to the northward of the Caraquette bank, and separated from it by Fisherman channel, which is a mile wide and carries from 4 to 7 fathoms water. This dangerous ledge, which lies more in the way of vessels than any other in Chaleur bay, is $1\frac{3}{4}$ miles long in an E. $\frac{1}{2}$ S. direction, and a third of a mile wide from the depth of 3 fathoms to 3 fathoms. There are no marks for it. Its northern edge is distant 3 miles from Caraquette island, and its east and west ends bear N.N.E. from the corresponding points of the island. The points of cliff at Great Anse and Donax point in one, bearing W. by N., lead through Fisherman channel, which, however, has not been examined very closely, and cannot in any case be recommended to vessels of large draught.

POKESUEDIE SHOAL is an extensive flat of sand extending 2 miles to the northward and eastward from Pokesuedie island, and having only 6 or 7 feet water over the greater part of it. Caraquette steeple and the

sandy south-east extreme of Caraquette island in line, bearing W. $\frac{1}{4}$ S., lead over its north point in 2 fathoms at low water; and if the steeple be kept half-way between the extreme of the sandy point and the extreme of the trees on the same island, the north point of the shoal will be cleared in $4\frac{1}{2}$ fathoms; but as both the sandy point and the trees may change in the course of years, those marks should not be relied on without previous examination.

CARAQUETTE CHANNEL, between the Pokesuedie and Caraquette shoals, forms the entrance to the harbour of Caraquette for a distance of $2\frac{1}{2}$ miles, and has water enough for vessels of the largest draught; but it is crooked, and only $2\frac{1}{4}$ cables wide between very steep shoals, and without sufficient leading marks; hence it becomes a very difficult channel, as before observed.

CARAQUETTE HARBOUR may be said to commence immediately within, or to the westward of Pokesuedie island, extending westward between the mainland and the Caraquette shoal and island. The church at Caraquette will be seen standing conspicuously on the ridge nearly opposite to Mizzenette point, and the houses and fish stores of Lower Caraquette nearly opposite to the island. In the eastern part of the harbour immediately within Pokesuedie, the depth is 5 and 6 fathoms; and there is not less than $3\frac{1}{2}$ fathoms till within half a mile of the south-east point of the island. Between the island and the main the channel is only $1\frac{1}{4}$ cables wide and carries only $2\frac{1}{2}$ fathoms water; but farther westward it increases to a quarter of a mile wide and $4\frac{1}{2}$ fathoms water, and is there sheltered by the Mizzenette sands, which dry at low water nearly across to the island. The bottom is of mud within the harbour, and of sand in the entrance, or Caraquette channel.

Caraquette bay extends 4 or 5 miles to the westward of Mizzenette point, being all shoal water except the narrow channel of the harbour, and terminating in the two shallow rivers, the South, and the North, in the mouths of which there are oyster-beds. The best watering-place is at a small stream, which descends the steep banks at Upper Caraquette near Brideau point.

Although this is an excellent harbour for vessels of moderate draught, and even capable of affording anchorage to much larger vessels, it is nevertheless an exceedingly dangerous place to a stranger. The approach to it is between shoals extending several miles from the shore, and there are neither beacons, buoys, nor competent pilots; hence, although 4 fathoms can be carried in at low water sufficiently far for vessels of large draught to be anchored in safety in that depth, yet it would not be prudent even for a vessel of moderate draught to attempt this harbour unnecessarily,

nor unless the circumstances of wind and weather be very favourable, with a flowing tide, and her boats ahead. Under such favourable circumstances the passage into the harbour will be attended with little risk to small vessels prudently conducted, and having the assistance of the Admiralty Plan in addition to following the directions.

DIRECTIONS.—To enter Caraquette harbour, observe that winds from N.W., round north, to S. by E. are fair for going in. If bound from the eastward; having brought the entrance of Miscou harbour to bear to the eastward of South, stand in towards it to 8 fathoms water: then run to the westward in that depth until the north-east extreme of the trees of Shippigan island opens to the southward of the south-west extreme of Miscou island, bearing S.E., when if the weather be clear Caraquette steeple will be seen in line with the north extreme of Caraquette island bearing W. by S. $\frac{1}{2}$ S. From thence steer S.W. $\frac{3}{4}$ W., or for Blanchard point, the wooded north extreme of Pokesuedie island, which may or may not be made out, as it will be on with the mainland, and distant 7 or 8 miles. However, keep the lead going, and do not approach the Shippigan flat nearer than the depth of 7 fathoms, and having run about $3\frac{1}{2}$ miles, Marcelle point, the wooded south-east extreme of Pokesuedie island, will be in one with Pokesuedie point, which is the sandy east extreme of the same island.

These points in one, bearing S.S.W., will lead half a mile westward of the north-west extreme of the Shippigan flat. Steer for those points in one, until Caraquette steeple comes in line with the south-east extreme of the trees of Caraquette island, bearing W. $\frac{1}{4}$ S.; immediately after which, or when the north extreme of Shippigan is in one with the south extreme of Miscou, bearing E. $\frac{3}{4}$ S., steer towards Blanchard point, bearing S.W. by W. $\frac{1}{2}$ W.* Having run not quite $1\frac{1}{4}$ miles towards Blanchard point, Shippigan steeple will come in line with Pokesuedie point, bearing South; and at the same time, or immediately afterwards, Caraquette steeple will be in line with the sandy south-east extreme of Caraquette island bearing W. $\frac{1}{4}$ S.

The vessel will now be within the entrance of the Caraquette channel, between the Caraquette and Pokesuedie shoals, and must haul to the westward immediately for Caraquette steeple, keeping it carefully in line with the sandy south-east extreme of Caraquette island, until the windmill on Alexander point (Shippigan island) comes in line with Pokesuedie point, bearing S.S.E., when the course must instantly be changed to S. W. by

* In order that neither tide nor lee-way may set the vessel out of the straight course towards Blanchard point, take care neither to open out or to shut in the trees or other object which may be selected as a mark on the mainland beyond the point.

W. ¾ W. The vessel will now be about to pass through the narrowest and most difficult part of the channel, and the course must be strictly attended to, and the lead kept going on both sides. If the water shoals to less than 4 fathoms, after the vessel has run upon the S.W. by W. ¾ W. course from a quarter to half a mile, it will be on the Pokesuedie side, and she must therefore sheer to the northward a little, or into 5 fathoms, and then resume the S.W. by W. ¾ W. course again until Caraquette steeple comes in line with the cliff of Brideau point, bearing W. ½ N. Alter the course again immediately the last-named marks come in line, and steer for them for three-quarters of a mile, then sheer to the southward a little, so that the steeple may be seen a little within and over the extremity of the point, or in line with the store upon it: keep it so until the cliffy points on the north-east side of Caraquette island are all shut in behind the east point of the island, and it will have led clear of the south extremity of the Caraquette shoal. The vessel will now be in safe anchorage, and a berth may be chosen at pleasure with the assistance of the chart, and in from 4 to 2½ fathoms at low water.

Vessels of large draught from the westward should pass outside of Fisherman ledge, not going to the southward into a less depth than 6 fathoms at low water until Marcelle and Pokesuedie points come in one, bearing S.S.W.; they should then haul in upon those leading marks, and proceed as before directed. A small vessel may pass through Fisherman channel guided by the leading marks, and the remarks which have been given when describing Caraquette shoal, Mizzenette ledge, and Fisherman ledge. She need not run so far to the eastward as a large vessel, but as soon as Shippigan steeple comes in line with Pokesuedi point, bearing South, she may haul in upon those leading marks, which will take her over the tail of Caraquette shoal in 3 fathoms; and as soon as the steeple of Caraquette comes in line with the sandy south-east extreme of Caraquette island, bearing W. ¼ S., she must steer for them and proceed as before directed. A person acquainted with the appearance of the objects given as leading marks will find little difficulty, when the weather is favourable for seeing them, in following out these directions. Perhaps Brideau point will be the most difficult to make out, but it is well described in the chart, and the conspicuous store upon it, and the small bay on its east side, will assist in pointing it out to strangers.

TIDES.—It is high water, full and change, in Caraquette harbour, at 2¾h.; and ordinary springs rise 6 feet, and neaps 3 feet. The rate of the tidal streams seldom exceeds one knot.

SHIPPIGAN SOUND, formed by Pokesuedie island and the mainland on the west, and by Shippigan island on the east, is an extensive place,

as will be seen in the chart. On the western side, within Pokesuedie island, is Simon inlet, the best harbour in the Sound. Within its entrance, between Marcelle and Brule points, the anchorage is quite land-locked, with water sufficient and space enough for vessels of large draught. On the opposite or Shippigan side are the bays of Alemek and Little Alemek. The latter is a shallow place, but has good anchorage off its mouth. The former, which is most to the southward, and by far the largest bay of the two, is an excellent harbour with 3 and 4 fathoms water, and secure in all winds. There is a church and village of Acadians at the head of this bay; and on Alexander point, its north point, stands the establishment of Mr. Alexander, and the windmill referred to in the directions for Caraquette. There is a bar of sand and mud extending across the Sound from Alexander point to Brule point, which limits the depth that can be carried into Alemek bay to $2\frac{3}{4}$ fathoms ; and into Shippigan harbour to $2\frac{1}{2}$ fathoms at low water.

On the mainland, nearly opposite the south point of Alemek bay, there is a windmill on Bernache point, the sandy north point of Basse bay, which is small and shallow. On the south point of this bay, three quarters of a mile to the southward of the windmill, stands the church and village of Shippigan; and off them is Shippigan harbour, which is a narrow channel with $2\frac{1}{2}$ to 4 fathoms water, and between shoals of mud and eel-grass nearly dry at low tide. This narrow channel continues $2\frac{1}{2}$ miles beyond the church, terminating at Shippigan Gully, the southern entrance of the Sound. The Gully is used by shallops and fishing-boats. The tide is generally extremely rapid in it, and there is often a heavy surf on its bar of sand, which dries in part at low tide, leaving a channel with only 4 or 5 feet water. Shippigan harbour is quite secure in all winds, and it is there that the greater part of the vessels, which have recently begun to visit the place for timber, lie moored. The watering-place is at a small stream in Basse bay, a short distance to the westward of the church.

SHIPPIGAN CHANNEL, leading into the Sound from the northward, is still more difficult than the Caraquette channel. The water is deep, but the passage is narrow and crooked, and without leading marks. For 3 miles, the breadth of the channel between the Pokesuedie and Shippigan shoals, which are exceedingly steep, is only from a quarter to a third of a mile. Three or four buoys judiciously placed would render the channel safe and easy, but without them it is very difficult, and should not be taken by a vessel of large draught without a pilot. The whole distance from Shippigan flat to Shippigan church is nearly 9 miles, and the navigation is difficult all the way. No directions which could be given

would enable a stranger to take a large vessel into the Sound without very considerable risk of getting on shore; but a vessel not drawing more than 12 feet may be taken in by the lead in fine weather, and with the assistance of the Admiralty chart, as follows:

DIRECTIONS.—Bring Marcelle and Pokesuedie points in one, bearing S.S.W., and steer for them. After passing the west end of the Shippigan flat the depths will be 9 to 7 fathoms in the channel, but they will decrease as the vessel approaches the Pokesuedie and Caraquette shoals. As soon as the depth is 5 fathoms alter course to S. by E., or so as may be necessary to follow the eastern side of the Pokesuedie shoal in that depth, until Caraquette steeple is open clear to the southward of the sandy south-east extreme of Caraquette island: she will then be at the entrance of the narrow part of the channel between the Pokesuedie and Shippigan shoals, and, if the wind be from the eastward, she had better haul over to the weather-side into 5 fathoms water, and follow that depth along the edge of the Shippigan shoals by the lead as before; but, if the wind be from the westward, follow the edge of the Pokesuedie shoal in the same manner. The mode of proceeding which has just been recommended would prevent a vessel from mistaking the side of the channel which she might be on, and from which the greatest danger of running on shore would arise. The depth of water in the channel varies from 6 to 9, and, in one place, to 12 fathoms over sandy bottom, but changing to clay and mud as the vessel advances into the Sound.

TIDES.—It would require a much longer experience than was afforded by the few weeks employed in the Admiralty survey to be fully acquainted with the set of the tides in the entrance of the Caraquette and Shippigan channels, where they doubtless change with the time of tide and other circumstances. The rate of the tides, however, seldom exceeded a knot even in the channels, where, of course, they are stronger than elsewhere. In Shippigan harbour the stream was very regular in fine weather, running in at the Gully, and to the northward, through the Sound, into Chaleur bay, from about half ebb to half flood by the shore, and in the reverse direction, or to the southward, from about half-flood to half-ebb. The time of high water, full and change, is 3h. 40m., which is about an hour later than at Caraquette and Paspebiac. The rise in ordinary springs is $5\frac{1}{2}$ or 6 feet, and in neaps 3 feet.

SHIPPIGAN FLAT is an extensive shoal of sandstone, thinly and partially covered with sand, and having in some parts not more than 6 feet water. It is the most northern of the Shippigan shoals, and extends $2\frac{3}{4}$ miles off the north side of the island, separating the channel leading to the harbours of Caraquette and Shippigan from that which leads into

Miscou harbour. The marks which have been given for leading to the westward of this shoal will be made out without difficulty ; and there is good warning by the lead all along its northern side, which may be safely approached to 6 fathoms in a large and to 3 fathoms in a small vessel.

MISCOU HARBOUR, frequently called Little Shippigan by the fishermen, lies between Miscou and Shippigan islands, and just within the sandy spit at the south-west extreme of Miscou, where the space of deep water, from 4 to 6 fathoms, forming the harbour for large vessels, is 2 cables wide, and upwards of a mile in length. The harbour for small craft is more extensive, there being a considerably greater breadth with 2 and $2\frac{1}{2}$ fathoms water, and also a narrow channel extending eastward through the flats of mud and weeds to within a mile of Miscou Gully, which boats can only enter at high water. The bottom within the harbour is soft mud ; in the channel, just outside the entrance, sand ; and between the shoals, farther out, sandstone.

DIRECTIONS.—Miscou harbour is much frequented by the American fishermen, many of whom must be better pilots for it than any other persons. The Miscou channel, leading to the harbour, between the Shippigan flat and the Shippigan shoals, on the south-west, and the Miscou flats on the north-east, is even still more difficult for a large vessel than the Shippigan channel, being in one part only $1\frac{3}{4}$ cables wide, between shoals so steep that there is not the slightest warning by the lead. In short, none other than small vessels should attempt this harbour without having first buoyed the channel, or secured the assistance of a competent pilot. A vessel of 12 feet draught may however run in with the assistance of the Admiralty chart, and the following brief directions :—

If to the eastward of the harbour, cross the Miscou flats to the south-west, at the distance of 3 miles off shore, in no less than 4 fathoms water : if to the westward, follow the northern edge of the Shippigan flat, in 4 or 5 fathoms. In either case open out the north-east extreme of the trees of Shippigan island, just clear of the south-west extreme of the trees of Miscou island, or keep the former in one with the extreme of the sandy spit at the south-west end of Miscou island, the latter being preferable if it can be made out. These marks will bear a little to the eastward of S.E. : steer for them until the water shoals to less than 4 fathoms, which will be on a point of the Miscou flats. Sheer to the south-west for about a quarter of a mile, or so as to deepen the water to 4 and 5 fathoms ; then steer S.E. $\frac{1}{2}$ S., or for Pandora point, a wooded extreme of Shippigan, half a mile within Pecten point, which is the sandy south point of entrance of the harbour.

In running this course the vessel will cross a bay in the Miscou flats in 4 and 5 fathoms : if the soundings deepen to more than the latter

depth at low water, sheer to the eastward, for the object is to keep on the Miscou and least dangerous side of the channel; and that will be effected without difficulty by the lead, since there are 8 and 9 fathoms in the channel. After running a short mile towards Pandora point, the points on the north side of Shippigan will be observed to come in one, bearing W. by S. $\frac{1}{2}$ S.; and about the same time a high sand hill, on the sand bars at the head of the harbour, will come on with the high-water extreme of the sandy spit of Miscou, bearing S.E. by E. $\frac{1}{4}$ E. The vessel will now be at the narrow part of the channel, and must follow the edge of the Miscou flats by the lead, in from 4 to 6 fathoms, sheering to the eastward the instant the depth is more than the latter, and to the westward when less than the former. The general direction of the course will still be towards Pandora point, until the points on the south-east shore of Miscou within the harbour open out, bearing E. by N. $\frac{1}{2}$ N., when the vessel will be in safe anchorage, although outside the entrance. If wishing to proceed farther, haul up for the high sand-hill on the sand bars already mentioned, about E. by S. $\frac{1}{2}$ S.; and when within the sandy points, steer about East, or for the Gully, for a short distance, choosing a convenient berth.

TIDES.—In Miscou harbour, it was high water, full and change, at $3\frac{1}{2}$ hours, and the rise was 5 feet in spring tides, and 3 feet in neaps. The tides appeared to set fairly in and out of the harbour, at a rate seldom amounting to a knot..

MISCOU FLATS and MISCOU ISLAND.—The 5-fathoms edge of the Miscou flats is fully $4\frac{1}{4}$ miles off to the north-west of the south-west point of Miscou, and there are not more than 3 fathoms at the distance of $2\frac{1}{4}$ miles from the same point. These flats, which are of sandstone, continue 4 or 5 miles to the north-east of the harbour; and near their northern termination there is an opening in the trees which extends across the island, and which has been mistaken by vessels, at night or in foggy weather, either for the harbour or the Gully, according as they were west or east of the island. The remainder of the shore is tolerably bold, with steep sandy beaches, which surround the north end of the island, where several stores and huts of the fishermen will be seen along the shore. The north point is distinguished by a green mound, or grassy sand-hill, and the shallow water does not there extend to more than a third of a mile off shore; but a sandy shoal commences immediately to the eastward of the point, and fronting the outlet of a small lagoon, where there are several fishing-stores and huts, stretches off a mile to the north-east. At that distance from the shore there are 3 fathoms water, but it is more than $2\frac{1}{2}$ miles out to the 5-fathoms edge of the shoal.

About $1\frac{1}{2}$ miles to the south eastward from the North point of Miscou is Birch point, a steep cliff of sandstone about 10 feet high, and which will be easily recognized by the white birch trees, which are higher there than in any other parts near the shore. A reef of stones and sand extends there half a mile out from the shore. The soundings in the chart will enable the mariner easily to avoid the shoal off the North point, either by night or by day. There is good anchorage on either side of it; under the North point in from 5 to 10 fathoms, in southerly winds, and off the lighthouse on Birch point, in from $3\frac{1}{2}$ to 6 fathoms, in westerly winds, the bottom being of sand, which holds sufficiently well for off shore winds.

LIGHT.—The lighthouse erected on Birch point, the north-east extreme of Miscou island, is a wooden octagon-shaped building, 74 feet high, and painted red. It exhibits a *fixed red* light which is of the greatest assistance to vessels rounding this low island at night, and especially to the numerous fishing schooners which frequent Miscou harbour. It is elevated 79 feet above the level of high water, and in clear weather is visible from a distance of 12 miles; it is seen from the westward over the island.

MISCOU BANKS extend about 22 miles to the eastward of Miscou, and the soundings upon them will afford full and sufficient guidance for a vessel approaching this part of the coast, as has been remarked in page 2. The shoalest parts of the banks will be found on an East line of bearing from the lighthouse on Birch point, whereon, for the first 6 miles off shore, there are only from $5\frac{1}{2}$ to 7 fathoms on a rocky bottom; after which the water deepens rapidly, there being from 12 to 17 fathoms with red sand, rock, and shells for the next 9 miles, at the end of which it deepens to 20 fathoms; at 7 miles farther, with depths between 20 and 30 fathoms, over red sand, gravel, shells, and broken coral, is the edge of the bank, where the depth increases rapidly to above 40 fathoms, and the soundings change to mud.

The northern edge of the banks, in 30 fathoms, is 7 or 8 miles to the northward of the East line of bearing from the lighthouse on Birch point, and passes the north point of Miscou, at the distance of 4 miles, into Chaleur bay, thus affording excellent guidance to vessels, as has been already remarked. These banks continue to extend off the coast to the southward, but with more regular soundings and a greater general depth than in the part to which the name of Miscou banks has been applied.

CHAPTER XIV.

GULF OF ST. LAWRENCE; WEST COAST,—COAST OF NEW BRUNSWICK; MISCOU ISLAND TO ESCUMENAC POINT, INCLUDING MIRAMICHI BAY.

VARIATION 23° to 21½ West, 1860.

ASPECT of COAST.—From the lighthouse on Birch point, Miscou island, to the lighthouse on Escumenac point, the distance is 57 miles, in a S.W. by S. direction. The intermediate coast is low and wooded, with sand bars and beaches, often inclosing shallow lagoons, through which the rivers discharge themselves into the sea. The entrances of these lagoons and rivers through the sand bars are usually termed Gullies along this coast. These Gullies are generally difficult of entrance, because of the shifting bars of sand off their mouths. They all afford shelter to boats, and some of them to small craft, but there is no harbour for shipping but at Miramichi.

There are no detached shoals along this coast, so that it may be safely approached to 10 fathoms water in the night-time, and to 6 or 5 fathoms in the day-time. Nevertheless shoal water extends to a considerable distance from the shore in several places, as for instance off the east side of Miscou, where, at Wilson point, 2½ miles to the northward of Miscou Gully, a sandy shoal extends a mile out to 3 fathoms water, and 1⅔ miles to 5 fathoms at low tide. Off Miscou Gully, 7 miles to the southward of the north point of Miscou, and mentioned in page 21 as only admitting boats at high water, the shoal water extends two-thirds of a mile ; and 4 or 5 miles farther to the southward, off the low sandstone cliffs of Shippigan island, there are rocky patches with little more than 2 fathoms upon them, and nearly a mile off shore. Still farther to the southward, along the coast of Shippigan island, and 6 miles to the northward of Shippigan Gully, there is another similar patch at the same distance nearly from the shore.

SHIPPIGAN GULLY, with its bar of sand, its rapid tide, and dangerously heavy surf occasioned by easterly gales, has been briefly mentioned in page 19, and is distant 22 miles from the North point of Miscou. The bar of sand, which dries in part at low water, shifts in heavy gales ; but there is generally a channel with 4 or 5 feet in it at low water, and the tide rises from 3 to 5 feet, according as it may be neap or spring tide. The 3-fathoms edge of the shoal water, outside the bar, is two-thirds of a mile off shore, after which the depth increases rapidly. The passage over

the bar and into this Gully is difficult and dangerous to strangers, but is continually used by the native fishermen with their small schooner-rigged shallops.

POCMOUCHE RIVER, $5\frac{1}{2}$ miles S.W. of Shippigan Gully, after traversing a shallow and extensive lagoon, enters the Gulf by a Gully through the sand-bars about a cable wide. A shifting bar of sand outside generally leaves a narrow channel, with 4 or 5 feet in it at low water, into the Gully, and there are from 9 to 12 feet for some distance within. The spring tides rise 5 feet, so that large schooners can be taken in by a native pilot, and in fine weather. On the south side of the entrance of the river from the lagoon inland, and $1\frac{3}{4}$ miles N.W. by W. from the Gully, there is a church, village, and saw-mill. The inhabitants, 300 or 400 in number, and principally of Acadian French and of Irish origin, live by fishing, a very limited agriculture, and lumbering.

GREEN POINT, which separates the lagoons of Pocmouche and Great Tracadie, and is $3\frac{1}{2}$ miles to the S.W. of Pocmouche Gully, has a rocky shoal extending off it three-quarters of a mile to the depth of 3 fathoms, and $1\frac{1}{4}$ miles to 5 fathoms at low water.

TRACADIE RIVER is somewhat larger, but in other respects similar to the Pocmouche. It has a church and village, in like manner, on the south side of its entrance from the lagoon inland, and which can be seen over the sand bars ; but the church bears S.W. by W. $3\frac{1}{4}$ miles from the north and principal Gully, instead of N.W. by W., as at Pocmouche, which will help to distinguish the one from the other. The inhabitants of Tracadie are principally Acadians, who live in the same way as those of Pocmouche : both rivers supply a considerable quantity of pine timber and deals, which are rafted alongshore to be shipped at Miramichi, and recently also at Shippigan.

The North Gully of Tracadie is $7\frac{1}{2}$ miles S.W. from Pocmouche Gully, and is at present the principal entrance to the very extensive lagoon, through which the river flows in a narrow channel between flats of sand, mud, and weeds, the habitation of innumerable shell fish. There are several huts and stores at the entrance of this Gully, which is $1\frac{1}{2}$ cables wide at high water ; but, like all the rest on this coast, has a shifting bar of sand off it, causing the depth, breadth, and direction of the channel to vary so frequently in heavy gales, as to render all instructions for entering it useless. When the Admiralty survey was made, in 1839, there were 6 or 7 feet over the bar at low water, and 11 or 12 feet at high water, spring-tides ; yet it was said that there is often not more than 8 or 9 feet in the highest tides. In the entrance of the Gully, and sheltered by the bar outside, small vessels may lie moored in from $1\frac{1}{2}$ to 3 fathoms water. There

are 2 and 3 fathoms in the channel of the river opposite the village, but that can only be reached by passing through the lagoon, where the channel in one part is so shallow that boats can only pass when the tide is in.

At 2 miles to the southward of the North Gully is the Old Gully, now nearly blocked up with sand, but which was formerly the principal entrance. South or Little Tracadie Gully is $3\frac{1}{4}$ miles S.S.W. $\frac{1}{2}$ W. from the North Gully, and had $4\frac{1}{2}$ feet over its bar in the summer of 1839. The South Tracadie river, which discharges its waters, after traversing a lagoon, by this last-named Gully into the sea, is separated from the North Tracadie by a point of the mainland which approaches near the sand bars, but still leaves a communication within them from the one lagoon to the other. There are huts and fish stores at the entrance of this Gully, and Acadian settlements at the entrance of the river. Within the sand-bars which enclose the lagoons of Tracadie, there is a well-sheltered boat or canoe navigation for 8 or 9 miles. Barreau point separates the lagoons of South Tracadie and Tabisintac. There is an entrance into this last-named lagoon, called the Raft Gully, 7 miles from South Tracadie Gully, but it is nearly blocked up with sand.

TABISINTAC RIVER.—Tabisintac Gully, 6 miles to the southward and westward of Raft Gully, is about $1\frac{1}{2}$ cables wide at high water, and has a shifting bar of sand, over which 6 or 7 feet could be carried at low water when it was surveyed, and 11 or 12 feet at high water in spring tides. The entrance of the Tabisintac river from the lagoon inland is 3 miles to the northward of the Gully, and can be seen over the sand bars. There is plenty of water in this river when once over the bar: 2 and 3 fathoms is the depth in the channel through the lagoon, and there is as much as 4 and 5 fathoms in some parts of the river: but the channel is too narrow and intricate for anything larger than boats or very small vessels. The tide flows 10 miles up the river, through an undulating country, and occasionally between steep banks of sandstone, which rise to about 100 feet above the sea. There are settlements on either shore, consisting principally of Scotch families; and there is a church on the south bank, $1\frac{1}{2}$ miles up from the lagoon.

Salmon are taken in considerable quantities in the Tabisintac. There are lobsters, oysters, and other shell fish in the lagoon; and cod fish come in upon the coast early in the season, and are fished for upon a small scale.

MIRAMICHI BAY.—Blackland point, the north point of Miramichi bay, bears W.S.W. $1\frac{3}{4}$ miles from Tabisintac Gully; it is low and swampy, with steep and black peaty banks, and there is a communication round it for boats within the sand-bars, from Tabisintac lagoon into the Inner bay of Miramichi.

Miramichi bay is nearly 14 miles wide from the sand-bars off Blackland point to Escumenac point, and $6\frac{1}{2}$ miles deep from that line across its mouth to the main entrance of the Miramichi, between Portage and Fox islands. The bay is formed by a semicircular range of low sandy islands, between which there are three small passages and one main or ship channel, leading into the Inner bay or estuary of the Miramichi. In continuing the description of the coast to the south-west, the first of the islands in Miramichi bay will be the Negowac sand-bar, which, together with several smaller sand-bars lying off Blackland point, form the shore for 4 miles to the W.S.W. from the Tabisintac Gully.*

The Negowac Gully, between the sand bar of the same name and a small one to the south-west, is nearly 3 cables wide and carries 3 fathoms water ; but a sandy bar, of the usual mutable character, lies off it nearly a mile, and had about 9 feet over it at low water at the time of the Admiralty survey. Within the Gully a narrow channel, only fit for boats or very small craft, leads westward up the Inner bay. The shoal water extends $1\frac{1}{4}$ miles off this Gully, but there is excellent warning by the lead here, and everywhere in this bay, as will be seen by the chart. Shoals, nearly dry at low water, extend from the Negowac Gully to Portage island, a distance of $1\frac{1}{4}$ miles.

Portage island is 4 miles long in a S.W. by S. direction ; narrow, low, and partially wooded with small spruce trees and bushes. The Ship channel between this island and Fox island is $1\frac{1}{2}$ miles wide.

Fox island, $3\frac{3}{4}$ miles long, in a S.S.E. direction, is narrow and partially wooded : like Portage island, it is formed of parallel ranges of sand-hills, which contain imbedded drift timber, and have evidently been thrown up by the sea in the course of ages. These islands are merely sand bars on a large scale, and nowhere rise higher than 50 feet above the sea. They are incapable of agricultural cultivation, but yet they abound in plants and shrubs suited to such a locality, and in wild fruits, such as the blueberry, strawberry, and raspberry. Wild fowl of various kinds are also plentiful in their season, and so also are salmon, which are taken in nets and weirs along the beaches outside the island as well as in the gullies.

Huckleberry island, the next and last of these islands, is nearly $1\frac{1}{2}$ miles long, in a S.E. direction. Fox Gulley, between Huckleberry and Fox islands, is about $1\frac{1}{2}$ cables wide at high water, and has 2 to $2\frac{1}{2}$ fathoms water in it, but there is a bar outside with 7 feet at low water. Huckleberry Gully, between the island of the same name and the mainland, is about 2 cables wide, but is not quite so deep as Fox Gully. They are

* *See* Plan of Miramichi Bay, Sheet 1, No. 2,187 ; scale, $m = 2$ inches : and Chart of Gulf of St. Lawrence, Sheet 8, No. 1,747 ; scale, $m = \frac{1}{4}$ of an inch.

both only fit for boats or very small craft; and the channels leading from them to the westward, up a bay of the main within Hucklebery island, or across to the French river and village (where there is a wooden church not easily distinguished from a barn), are narrow and intricate, between flats of sand, mud, and eel-grass, and with only water enough for boats.

At $6\frac{1}{4}$ miles from the Hucklebery Gully, along the low shore of the mainland, in an E. by S. $\frac{1}{2}$ S. direction, is Escumenac point. Rather more than a mile from the Hucklebery Gully towards Escumenac point stands the South *beacon*, which is large and white, and has a white roofed barn behind it, the two objects having been intended to lead in the best water over the bar; but they are too close together, and do not answer the purpose. There are houses, where some of the pilots reside, for 2 miles along the shore to the eastward of the South beacon.

ESCUMENAC POINT, the south-east point of Miramichi bay, is of peat, upon a very low sandstone cliff, and is wooded with spruce-trees, which form a dark ground for the white lighthouse on it, rendering it so conspicuous that it can be seen at times from a distance of 13 or 14 miles. It is so difficult, especially for a stranger, to distinguish one point of this low coast from another, that this lighthouse is very useful to vessels bound to Miramichi, and making the land from sea. It also points out the position of the dangerous Escumenac reef, which extends 2 miles out to the N.E. from the lighthouse to the 3-fathoms mark, and $2\frac{3}{4}$ miles to 5 fathoms at low water. In the night time vessels should not stand nearer to this reef than the depth of 10 fathoms.

LIGHT.—The lighthouse, which has replaced the beacon on Escumenac point, is an octagon, wooden tower, painted white, and 58 feet high. It shows, at an elevation of 70 feet above the level of high water, a *fixed white* light, which in clear weather can be seen from a distance of 14 miles.

MIRAMICHI BAR commences from the south-east end of Portage island, and extends across the main entrance, and parallel to Fox island, nearly 6 miles in a S.E. by S. direction. It consists of sand, and has not more than a foot or two of water over it in some parts, at low spring tides. Near Portage island there is water enough over it for small vessels, and there is a still deeper part near its south-east end, called the Swashway, where 13 or 14 feet could be carried over at the time it was surveyed in 1837; but Commander Orlebar's re-examination of it in 1857 has shown that heavy gales have altered the deposition of the sand on this bar, and that the depth in the Swashway has increased to 16 feet, whilst it has decreased in the Ship channel to 17 feet at low water, or 22 feet at high water in ordinary spring tides. Moreover, the shallowest part of the

Ship channel instead of being, as formerly, in a line from the Bar buoy to the south-east end of Fox island, is now 6 cables N.N.W. from the Bar buoy, and extends from the Lump buoy in an E.S.E. direction, towards the 12-feet patch to the south-east of the Swashway.

The south-east extreme of the bar extends about 2 cables beyond the patch just mentioned; and the mark for clearing it, is to keep the church at French village so as to be seen through the centre of Fox Gully, bearing West; but the church will not easily be made out by a stranger, being a wooden building only distinguished from the barns near it by a belfry.

The Bar buoy (*black*) is moored in 3 fathoms at low water on the inner or south-west extreme of the bar, and must therefore be left to the eastward or on the right, going in. About a mile N.N.W. from the Bar buoy is the Lump buoy (*red*), moored in the same depth of water on the Lump, which is a shoal with 2 fathoms least water on the west side of the channel. There is no passage for large vessels between the Lump and Fox island, but there are holes with 4 fathoms water, and a channel of $2\frac{1}{2}$ fathoms at low water, which might be rendered available by buoying if it were requisite, but which is too narrow and intricate without such assistance. In its present state, therefore, and for vessels of large draught, the whole of this part may be considered as one shoal, extending $1\frac{1}{4}$ miles to the eastward, from the shore of Fox island to the Lump buoy; and, thus overlapping the south-west point of the bar, where the Bar buoy is placed, it renders the channel crooked and difficult. In heavy easterly gales in the fall of the year, especially during the ebb tide, there is a dangerous and heavy breaking sea here, which has in several instances proved fatal to vessels, rendering them unmanageable, so that they have been cast ashore on the islands.

To avoid this difficult part, the Swashway is now much used by the pilots, as being more direct. Their mark, the south end of a clump of trees on Fox island, in line with the wooded south point of Vin island, bearing W. $\frac{1}{2}$ N., leads nearly to the Lump buoy, but could not be made out by strangers.

Within the Lump buoy, which must be left to the westward, the channel is clear and straight, about half a mile wide, and with 4 to 7 fathoms water all the way to another *red* buoy on the same side of the channel, and moored in $4\frac{1}{2}$ fathoms and about a cable's length from the edge of the shoal. This is the red buoy of the Spit, a sandy shoal, with only a few feet water upon it, extending half a mile from Fox island. The course and distance from the red buoy of the Lump to the red buoy of the Spit is N.W. by N. 3 miles. Both the Lump and Spit are steep shoals, but between them a vessel may run along, or even work on the south-west side of the channel in 4 or 3 fathoms by the lead.

On the opposite or north-east side of the channel the bar is extremely steep, and the leading mark for it, the easternmost white house of Burnt Church village (on the north side of the bay) just open to the south-west of Portage island, bearing N.W. by N., is neither certain, (since another house may be built,) nor readily distinguished by a stranger. The shoal of the Spit trends West, not quite a mile, from the red buoy towards the north point of Fox island, where the shoal water extends only one cable off shore. On the north point of Fox island two small *beacons* will be seen on the sand-hills, the one *red* and the other *white:* these kept in one, and bearing S.E. $\frac{1}{2}$ E., lead in 14 feet at low water, within, or to the westward of the 10-feet mound, on which a *white* buoy is now moored, to what was formerly the outermost red buoy on the Horse-shoe shoal, but which is now the second inward from its south-east extreme.

HORSE-SHOE SHOAL consists of sand and gravel, and is of great extent. The least water on it is 3 feet, and it is separated from the shoal on the inner side of Portage island by a narrow and intricate channel, which is seldom or never used.

There are four *red* buoys moored nearly in line on the southern side of the Horse-shoe shoal, occupying a space of nearly three-quarters of a mile in a W. $\frac{1}{2}$ S. direction; and the course and distance, from the westernmost *red* buoy to the *black* buoy on the south-west extreme of the shoal, is S.W. by W. $\frac{3}{4}$ W., two-thirds of a mile.

INNER BAR.—To the southward, the Horse-shoe is separated from the shoal which connects together Fox, Egg, and Vin islands, by the very narrow Ship channel, (over the Horse-shoe or Inner bar,) which is only one cable wide, but is rendered less difficult than formerly, by the addition of the white buoy on the 10-feet mound, and of the red buoy on the south-east end of the Horse-shoe shoal. These additional buoys enable the pilots to use the more direct channel between them, as recommended in former editions of these directions, instead of passing to the southward of the 10-feet mound; by which also they gain about a foot more water, the depth that could be carried through at the time of Commander Orlebar's re-examination in 1857, being 15 feet at low water, and 20 feet at high water in ordinary springs.

ANCHORAGE.—There is good anchorage, in 4 or 5 fathoms, between the Horse-shoe and the southern end of Portage island, where vessels may safely anchor during the summer months.

Within the black buoy, on the south-west extreme of the Horse-shoe shoal, is the usual place where vessels, bound to sea, anchor, to wait for a wind, or high tide, to enable them to cross the Inner bar.

TIDES.—The tidal streams are not strong in the open bay outside the bar of Miramichi. The flood draws in towards the entrance as into a

funnel, coming both from the north-east and south-east alongshore from Tabisintac, as well as from Escumenac point. It sets fairly through the Ship channel at the rate of about $1\frac{1}{2}$ knots at the Bar buoy, increasing to 2 or $2\frac{1}{2}$ knots in strong spring tides between Portage and Fox islands, where it is strongest. The principal part of the stream continues to flow westward, in the direction of the buoys of the Horse-shoe, although some part of it flows to the northward between that shoal and Portage island. The ebb sets out in the opposite direction, being strongest at the buoys of the Horse-shoe, and in the entrance between Fox and Portage islands, where in spring tides it often runs $2\frac{1}{2}$ miles per hour, and is said to be still stronger when the waters are high in the spring of the year. The ebb sets out to the eastward from the Lump buoy over the tail of the bar, and should be guarded against in light winds.

The winds affected the tides very considerably, and, together with the smallness of the rise, rendered it extremely difficult to make correct deductions from a number of observations so limited as those which were obtained. The easterly winds always make high tides, and sometimes cause the neap to be higher than the spring tides. The time of high water, full and change, at the south-west end of Vin island was at about $5\frac{3}{4}$ hours, and the pilots say that it is at about 5 hours on the bar. The rise of an ordinary spring tide is 5 feet, and of neap tides 3 feet; but the rise is at all times uncertain, neap tides sometimes not ranging above a foot, and spring tides not above 2 feet. It must also be remarked that the a.m. tides rose higher, in general by 2 feet, than the p.m. tides, in the beginning of August, which was the only opportunity of observing them.

DIRECTIONS.—The bar of Miramichi should never be attempted by a vessel of large draught, or by persons not thoroughly acquainted with it, without a branch pilot, if one can be procured. The Miramichi pilots are in general well qualified, and will generally be found cruizing in small schooners off Escumenac point, or will come off to any vessel which may heave in sight; but in case of emergency, and no pilot at hand, proceed as follows: observing first that if the lighthouse on Escumenac point has been sighted too late in the day to run in before dark, the vessel must stand off and on till daylight, coming into no less than 12 fathoms water, especially with an easterly wind.

If Fox Gully can be made out, do not bring it to bear to the southward of West, and look out for the church at French village, which kept in the centre of the Gully will lead about a third of a mile to the south-east of the Bar buoy, on the south-west end of the bar. But the Gully and church would both be difficult to make out by strangers; therefore a safer and better plan is to bring the lighthouse on Escumenac point to bear South: stand in towards it to 5 fathoms water, and then run alongshore to the westward in that depth, which will lead to within

a short distance of the Bar buoy. This buoy lies in 3 fathoms at low water, with the South beacon bearing S. by E. $\frac{1}{2}$ E., and the south-east extreme of Fox island W. by S. Pass close to the westward of the Bar buoy, and steer from it so as to pass about half a cable to the eastward of the Lump buoy, which will be seen bearing N.N.W., and distant a mile from the Bar buoy. Being up to the Lump buoy, steer N.W.$\frac{3}{4}$ N., or so as to pass close to the eastward of the Spit buoy. The distance from the one buoy to the other is 3 miles; and if the weather be so hazy that the last named buoy cannot at first be seen, run along the south-west side of the channel in 4 fathoms by the lead until it is.

After passing close to the northward of the Spit buoy, steer W. by N. $\frac{1}{2}$ N. from it, or so as to pass to the northward of the white buoy on the 10-feet mound, and then midway between it and the eastern-most red buoy on the Horse-shoe, steering W. $\frac{1}{2}$ S. Leave all the four red buoys to the northward, at the distance of not more than half a cable, and on arriving at the westernmost red buoy, alter course to S.W. by W. $\frac{3}{4}$ W., so as to leave the black buoy on the south-west extreme of the Horse-shoe, also to the northward, or on the right hand.

If it should be desired to pass, by the old route, to the southward and westward of the 10-feet mound, after passing close to the northward of the Spit buoy, steer W. by N. from it for a little more than half a mile, or until the west ends of Egg and Fox islands come in one, bearing S.W. $\frac{1}{4}$ S. Then alter course to W.S.W., or towards the north-east point of Vin island, which steer for, passing the north point of Fox island at the distance of 2 or 3 cables, until the two small beacons upon it come in one, bearing S.E. $\frac{1}{2}$ E. Then haul up instantly to the north-west, or so as to keep the beacons in one astern, and they will lead, in 14 feet at low water in ordinary spring tides, to within half a cable from the second red buoy inwards from the east point of the Horse-shoe; then bear up smartly to the westward, so as to leave all the buoys to the northward, at the distance of half a cable, as before directed.

Having passed the black buoy on the south-west extreme of the Horse-shoe, the vessel may either be safely anchored within it, or may proceed farther, with the assistance of the Admiralty chart, and the directions in page 35.

The INNER BAY of MIRAMICHI is of great extent, being about 13 miles long from its entrance at Fox island to Sheldrake island (where the river may properly be said to commence), and 7 or 8 miles wide. The depth of water across the bay is sufficient for the largest vessels that can cross the Inner bar, being $2\frac{3}{4}$ fathoms at low water in ordinary spring tides, with muddy bottom.

Egg and Vin islands are on the southern side of the bay; the first

small, low, and swampy, the other much larger, being $2\frac{1}{4}$ miles long, and for the most part thickly wooded.

VIN HARBOUR is to the southward of Vin island, and must be approached round its west end, which is distant nearly $4\frac{1}{2}$ miles from the north point of Fox island. It is quite sheltered from all winds, and has plenty of water for the largest ships that can enter the Inner bay.

DIRECTIONS.—A pilot will readily be procured to take a ship into Vin harbour, or the intelligent seaman may do without one, with the assistance of the Admiralty chart, as follows:—Steer W.S.W. from the black buoy of the Horse-shoe for about 3 miles, and then to the southward round the west end of Vin island, at a distance not less than three-quarters of a mile, until the sandy points on the south side of the island open, bearing E. $\frac{1}{2}$ N. Steer for them, keeping them just open, and, on approaching the sandy south-west point of the island, steer to the southward sufficiently to give it a berth of from half a cable to a cable as the vessel rounds it into the harbour. Do not go to the southward of the line joining the sandy points of the harbour, or she will be on shore on the sandy shoal which extends off the main land opposite. The harbour is a bay of the island, three-quarters of a mile wide and 3 cables deep. Anchor near the centre of it in 10 or 11 fathoms, mud bottom.

The long sandy Vin spit and shoal of the main already mentioned runs out to the northward, nearly to the line joining the sandy points of the harbour, but leaves a narrow channel to the eastward, which continues for about 2 miles, and may be considered as a prolongation of the harbour in that direction, or towards French River point. French river is small and shallow, and has a village of Acadians and a church, which bears W. $\frac{1}{4}$ S. from Fox Gully, from which it is distant $1\frac{1}{4}$ miles. The space to the eastward of the line joining Egg island and French River, and in the bay to the southward of the latter, is occupied by flats of sand, mud, and eel-grass—the habitat of oysters, lobsters, and other shell-fish. Shallow and intricate boat channels lead through these flats to Fox and Hucklebery Gullies.

VIN BAY is more than 3 miles wide, and nearly as deep. Quart point, its western point, is a low cliff of sandstone with high trees, bearing about W. by N. $3\frac{1}{3}$ miles from the west end of Vin island. There is good anchorage in the eastern part of this bay, in 3 fathoms, mud bottom, and about three-quarters of a mile to the westward of the island. The western side of the bay is shallow. In its south-west corner is Black river, into which 9 feet can be carried at low water through a narrow and difficult channel, and the river has 3 fathoms in it for some distance within the entrance.

Vin river also runs into this bay, $2\frac{1}{2}$ miles S. W. $\frac{1}{2}$ W. from the south-west point of the island. It is a smaller river than Black river, having

only 6 feet at low water in its entrance. There is a small but neat church on its eastern shore, a short distance within its entrance, and flourishing farms on either side, where supplies may best be obtained. The best watering-place will also be found at this river; but it is difficult to obtain large supplies of good water in so flat a country near the sea. There is a tolerable road from Vin river to Chatham, the principal town on the Miramichi river.

CHEVAL POINT, bearing W. by N. $\frac{3}{4}$N. nearly 3 miles from Quart point, is sandy, with a remarkable clump of high trees upon it.

Immediately to the westward of Cheval point is the shallow Napan bay and river, which boats can ascend for several miles, or as far as the tide reaches. Above that point the river, which is small, runs through a fertile and well-cultivated valley, extending westward in rear of the town of Chatham.

MIDDLE GROUND is a long sandy bank, which stretches down the centre of the estuary from Cheval point, and extends from it 5 miles to the eastward. The east end of this bank will be cleared by keeping French River point open to the eastward of Vin island, bearing S.E. The Ship channel is between the Middle Ground and the north shore of the bay.

SHELDRAKE ISLAND lies off Napan point, at the distance of rather more than three-quarters of a mile, and bears from Cheval point N.W. by W. $1\frac{3}{4}$ miles. It is low, swampy, partly wooded, and has two buildings on its eastern side, which were formerly used as a cholera hospital,— a strange situation, considering that the place is a swamp, and the mosquitoes innumerable. The island is a third of a mile long by a quarter of a mile wide, and is separated from the north shore by a channel half a mile wide, but with only 1 or 2 feet in it at low water. Shallow water extends far off this island in every direction,—westward to Bartiboque island, and eastward to Oak point. It also sweeps round to the south and south-east, so as to leave only a very narrow channel between it and the shoal, which fills Napan bay, and trending away to the eastward past Cheval point, forms the Middle Ground already mentioned.

Murdoch spit and Murdoch point are two sandy points on the south shore, a third of a mile apart, with a cove between them, and about a mile W.S.W. of Sheldrake island. The entrance of Miramichi river is three-quarters of a mile wide between these points and Moody point, which has a small Indian church upon it, and is the east point of entrance of Bartiboque river, a mile N.W. by W. $\frac{1}{2}$ W. from Sheldrake island.

One mile and a half above Murdoch point, and on the same, or south

side of the river, is St. Andrew point, showing as the extreme of the land from Sheldrake island. Both these points were wooded at the time of the survey in 1837, and used as leading marks.

BARTIBOQUE RIVER is three-quarters of a mile wide at the entrance, between Malcolm and Moody points, but contracts to $1\frac{1}{2}$ cables a short distance within, where a wooden bridge is thrown across. Bartiboque island lies in the entrance of the river, and has steep banks or clay cliffs on every side, and is nearly joined to the shore to the northward by a sandy spit. The narrow channel into the river passes close to the east end of the island, and has not more than 4 feet in it at low water.

OAK POINT.—Returning back to the eastward, along the north shore, the first point requiring notice is Oak point, nearly opposite Cheval point, and distant from it 2 miles to the N.N.E. The eastern part of this point has dark-coloured sandstone cliffs, about 12 feet high, and forming an extreme point ; it is used as a leading mark with the *white beacon* which stands N.E. by E., at the distance of two-thirds of a mile from it on the shore of the bay. The beacon is lofty and large, and shows so conspicuously on the dark background of the woods, that it can be easily seen on a fine day from Fox island.

Grandoon island, low and marshy, and difficult to distinguish from the main land till very near, is distant $2\frac{1}{3}$ miles, E. by N. $\frac{1}{4}$ N. from Oak point ; and $3\frac{1}{2}$ miles N. by E. from Quart point. Farther eastward, along the northern shore of the Inner bay, are Burnt church, and the Indian village, and small river of the same name ; also Hay island, and the Acadian villages of Upper and Lower Negowac, inhabited by fishermen and farmers, and having excellent oysters in their vicinity. The situation of those places will be seen in the chart ; and as they lie out of the line of the ship-navigation, they will require no farther notice here than to remark that there is a clear channel, with $3\frac{1}{2}$ to $2\frac{1}{4}$ fathoms water in it, to the northward of the Horse-shoe and the shoals of Portage island, as far north-eastward as Hay island, where a narrow channel leads out to sea through the Negowac Gully (page 27).

DIRECTIONS.—The following remarks will describe the Oak channel, and include directions for taking a vessel up to the entrance of the Miramichi river.—Being about a cable's length to the westward of the black buoy on the south-west extreme of the Horse-shoe (page 32), steer N.W. $\frac{3}{4}$ W. towards the east point of Grandoon island ; taking care not to shut French River point in behind the east end of Vin island, until the south extreme of the trees on the north side of the entrance of Napan river, opens out just clear to the northward of Cheval point, bearing W.S.W. If the last named marks

cannot be made out never mind them, but simply run from the black buoy N.W. $\frac{3}{4}$ W. 4 miles or towards the east end of Grandoon island. The depths will be from $3\frac{1}{4}$ to $2\frac{3}{4}$ fathoms, at low water in ordinary spring tides, as the vessel crosses the bay; and she will have the least water as she passes the east end of the Middle Ground, deepening again to 3 or $3\frac{1}{4}$ fathoms on arriving at the Oak channel, which will be when she has run the above distance. The east end of Grandoon island should now be right ahead, at the distance of $1\frac{1}{5}$ miles; and it must be borne in mind that the shoal water extends a full half mile from the island, which is sandy and covered with grass, and four-fifths of a mile long. There will be no occasion to approach the island nearer than three-quarters of a mile in passing towards the Grandoon buoy, which will be seen at the distance of $2\frac{1}{2}$ miles to the westward, after running N.W. $\frac{3}{4}$ W. 4 miles.

The Grandoon buoy lies in 3 fathoms on the north side of the Oak channel, and at the extremity of the shoal which extends a long mile S.E. from the white beacon. Bring the buoy to bear W. by S. $\frac{1}{4}$ S. and steer for it; carrying depths of $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms at low water, in a channel half a mile wide, until up to the buoy, which has $4\frac{3}{4}$ fathoms close to the southward. Pass to the southward of the buoy at any distance not exceeding one cable, when the extreme of the trees on St. Andrew point will be seen just open to the northward of the trees on Sheldrake island, bearing W. $\frac{1}{4}$ S; keep them so in running to the westward in a channel two-thirds of a mile wide, with $2\frac{1}{2}$ to 6 fathoms water, until the white beacon becomes only just open and to the eastward of the cliffs of Oak point, bearing N.E. by E. Take care not to bring the beacon in line with the cliffs, or the vessel will be on shore; but begin to edge away to the S.W. as soon as the marks are perceived coming nearly on. Steer S.W. by W. or so as to keep the beacon just open of the cliffs; and having run $1\frac{1}{3}$ miles, those marks will have led up to the Narrows buoy, between the Sheldrake and Napan shoals.*

The Narrows buoy lies in 3 fathoms on the north side of the Sheldrake channel, which is there only $1\frac{1}{2}$ cables wide, but it carries $9\frac{1}{2}$ fathoms water. Pass close to the southward of the Narrows buoy, steering W. by S. for about 2 cables past the buoy, when the extreme of the trees of St. Andrew point will be seen to come nearly in one with those of Murdoch point, bearing W. $\frac{3}{4}$ N. Keep the trees of St. Andrew point just open, running about half a mile towards them, or until the middle of Sheldrake island bears North: then haul up N.W. by W. $\frac{1}{4}$ W. for the Sheldrake buoy, which will be seen at the distance of a mile in that direction. This buoy is placed in 3 fathoms water on the south-west side of the Sheldrake shoals; bearing West a third of a mile from the south-west point of Sheldrake island, and N.N.E. $\frac{3}{4}$ E. a quarter of a mile from Spit point. Pass to the

* *See* Plan of Miramichi Bay and River, sheet 2, No. 1,712; scale, $m = 1$ inch.

southward of it, at the distance of half a cable, and after continuing the course for half a mile, the vessel may anchor in 4 fathoms at low water, over muddy bottom, and nearly midway between Murdoch point and the east end of Bartiboque island. There she will be well sheltered by Sheldrake island and its shoals from easterly winds; and may water at Moody point, or at any of the brooks which descend the steep banks to the westward of Bartiboque river. The rate of the tides seldom exceed 2 knots at this anchorage; but in the Narrows of Sheldrake channel the rate of the ebb is 3 knots and perhaps stronger when the waters are high; as for instance in the spring of the year.

MIRAMICHI RIVER may be said to commence at Sheldrake island; for below that point the Inner bay, with its low and widely receding shores, bears no resemblance to a river. It is three-quarters of a mile wide at Murdoch point, and half a mile at St. Andrew point, a breadth which it retains nearly all the way to Chatham. At its entrance, the country begins to rise into gentle undulations, terminating in steep banks and cliffs of sandstone, which in some places attain a height of 50 feet above the river. The settlements too increase in number and extent, and soon become continuous on either side. In the vicinity of the towns of Chatham, Douglastown, and Newcastle there are many pretty buildings; and the country is by no means devoid of beauty, although the dead and half-burnt stems of the large pine-trees, still standing out from among the young growth of light green poplars, give a desolate appearance to the background in the rear of the settlements, and remain a gloomy record of the terrible calamity which they commemorate,—the great fire of 1825.

The rocks which appear on the banks of the river are sandstones belonging to the coal formation, the vegetable organic remains of which are frequently met with in veins containing bituminous coal. Thin seams, or veins of coal of good quality have been met with, but not as yet in such quantities as to be worth the working. The soil is deep; and although light and friable, seems sufficiently fertile for almost every agricultural purpose. Agriculture is not, however, the principal pursuit of the inhabitants, the majority of whom are engaged in occupations more or less connected with the timber trade. Farming is nevertheless carried on successfully and to a greater extent every year. The salmon and gasperaux (or ale-wives) fisheries are also extensively prosecuted in their seasons; and cod-fishing, on the banks in the Gulf at the distance of only a few hours' sail, lie open to the enterprise of the people of Miramichi, whenever it may suit their interests or their humour to leave it no longer almost exclusively to the American fishermen.

DIRECTIONS.—The Miramichi is navigable up to Beaubère island by any vessel that can cross the Inner bar (page 30). Written directions,

however, will not much avail above Sheldrake island, not only on account of the contracted nature of the navigation, but also because there are few leading marks of a permanent nature, which could be certainly recognized by a stranger. Directions too are not so requisite for this inland navigation, for which there are abundance of well qualified pilots. The trend and nature of the main channel will therefore only be pointed out, noticing briefly the dangers to be avoided, and the most remarkable features and objects on either side as the vessel proceeds up the river.

Vessels having arrived at the Sheldrake buoy on the south-west extremity of the Sheldrake island shoals, should steer so as to make a W.N.W. course, taking care not to go to the southward into less than $3\frac{1}{2}$ fathoms; or to the northward so far as to cross the deep water channel of 6 fathoms, or to shut in Oak point behind Moody point, until they are half a mile above the entrance of the Bartiboque. They will thus avoid the Andrew banks, lying in the middle of the river, with 10 or 11 feet least water; and also that which lies $1\frac{1}{4}$ cables off Malcolm point. Being more than half a mile above the Bartiboque river, they must sheer in towards the north shore, until the Indian church on Moody point comes in line with the cliffs on the south side of Bartiboque island, bearing East; and then keeping the church just in sight, it will lead up in the deep water, and within a cable's length of the shore in some places, to the buoy at the north-west extreme of the Leggat shoals.

LEGGAT SHOALS lie nearer the north than the south side of the river, and at the time they were surveyed had 12 feet upon them at low water; but this depth is said to vary, and also upon the banks of St. Andrew, in consequence of old trees, logs, and other lumber lodging upon them. The same cause is said to render the depth uncertain to the southward of these shoals, where there is a wider channel. The channel at the buoy on the north-west extreme of the shoals has 5 fathoms water in it, and is nearly a cable wide, between the Leggat shoals and a shoal bank which extends off the north shore. On the point of this shoal off the north shore there is another buoy, which will be seen at the distance of a quarter of a mile W. by S. $\frac{1}{4}$ S. from the former. Vessels must pass close to the northward of the first of these buoys, and close to the southward of the second, which is 2 miles above the Bartiboque river. The river is clear of detached shoals from the buoys last mentioned to Middle island, which, together with its shoal, confines the ship channel to the north side of the river, where the shore is so bold that there are 7 or 8 fathoms close to the sandstone cliffs until the vessel is off the Gilmour mills and cove, nearly opposite the west end of Middle island.

MIDDLE ISLAND is rather smaller than Sheldrake island, from which it is distant $5\frac{1}{2}$ miles; and there is no channel to the southward of it at

low water. There is nothing in the way of vessels from Gilmour mill to the wharves at Chatham.

CHATHAM, the principal town on the Miramichi, and containing, in 1837, about 1,500 inhabitants, commences half a mile above Middle island, and extends along the south shore for $1\frac{1}{4}$ miles to the westward. It is conveniently situated for shipping, having 6 to 8 fathoms water close to its wharves. It is a straggling, but rapidly increasing town, having some good houses, three churches and two other chapels or places of worship. These buildings are all of wood, neatly painted and finished, and together with the steam saw and grist mill of the Messrs. Cunard form the most remarkable objects. In the year 1856, 166 vessels (18,061 tons) entered inwards, and 136 vessels (17,800 tons) cleared outwards.

DOUGLASTOWN, on the opposite or northern shore about $1\frac{1}{2}$ miles above Chatham, is a much smaller place, containing, in 1837, about 400 inhabitants. It is prettily situated on a rising ground, and has sufficient water at its wharves for large vessels. The most remarkable building is the Marine hospital, built of stone. Mr. Abram's ship building establishment is $1\frac{1}{4}$ miles above Douglastown, on the same side of the river; and opposite to it on the south shore is the church of St. Paul.

NEWCASTLE, 12 miles farther up the river, and on the north shore, is the county town; containing the court house and jail, a church, a chapel, and some few other good buildings. The estimated number of inhabitants in 1837 was somewhat less than a thousand. Standing on an acclivity which rises to the height of 100 feet at a quarter of a mile from the river, and commanding a view over the lower ground westward and southward to Beaubère island, and Nelsontown, and down the river to Chatham, a distance of nearly 5 miles, its situation is as beautiful as could have been selected, while at the same time it is not unfavourable for mercantile purposes, the channel of the river opposite to it being a third of a mile wide, clear of shoals, and 6 or 7 fathoms water close to the wharves of the town.

NELSONTOWN, the last village within the navigable waters of the Miramichi, is a straggling place with 200 or 300 inhabitants, principally of Irish origin, and possessing a large wooden church, which stands on the south shore, opposite the east end of Beaubère island, and $1\frac{1}{2}$ miles above Newcastle.

BEAUBERE ISLAND, $1\frac{1}{4}$ miles long, and a quarter of a mile wide, is a pretty island, having steep clay banks, based on sandstone, and rising to

about 20 feet above the river. On its east end there was formerly a ship building establishment belonging to Messrs. Fraser & Co.

The Miramichi is easily navigable to this point by any vessels that can cross the Horse-shoe or Inner bar (page 30). There are some parts of the channel above Chatham where there are only $2\frac{1}{4}$ fathoms, and which would have to be avoided by a large vessel at low water; but there is only one detached shoal, which has 9 feet least water, and lies less than half way across from the south shore, between Mr. Wright's and Mr. Peter's houses, the former in 1837 being the Collector of Customs.

TIDES.—The usual average rate of the ebb tide is 2 knots, and the floot 1 knot in this part of the river. The ebb in some places runs $2\frac{1}{2}$ knots, and in the spring of the year is said to be still stronger. It is high water, full and change, at Beaubère island at $6\frac{1}{2}$h.; and ordinary spring tides rise 6 feet, and neaps 4 feet. In July and August, when the observations were made, excepting for 2 or 3 days at neap tides, the morning tides rose 2 or 3 feet higher than the evening tides, and were of longer duration by one or even two hours at a time. But this is much influenced by winds, and consequently by no means regular. The mean length of the flood tide is 6h., and of the ebb $6\frac{1}{2}$h. The duration and length of the tidal streams are also influenced by the winds, but in general they continue in the channel about half an hour, after it is high or low water by the shore.

NORTH-WEST and SOUTH-WEST ARMS.—At Beaubère island the two great Arms of the Miramichi meet. The North-west Arm is much the largest, as respects the tidal water, although the South-west Arm is considered the main branch, being of greater length, and discharging more water. The North-west Arm would be navigable for large vessels to Shilelah cove, 7 miles above Beaubère island, as there is sufficient depth of water, if the channel were buoyed or staked in the narrow parts, which are not more than half a cable wide. Above Shilelah cove there are from 1 to $1\frac{1}{2}$ fathoms water, in intricate and narrow channels between shoals of mud and low marshy islands, all the way to the rapids, which flow in narrow channels between meadow islands. There the tide ends, and the water becomes quite fresh 13 miles from Beaubère island, and 39 miles from the entrance of the Inner bay at Fox island. There is an Indian village on the south-west shore, just below the rapids, and the scenery in this fine Arm possesses considerable beauty. The banks of clay and sandstone are almost everywhere bold and dry, with improving farms on either side.

The South-west Arm is not navigable for large vessels, as not more than 6 or 7 feet, at low water, spring tides, can be carried through

between Beaubère island and the mainland ; and even above that shallow part, although there is often more than 2 fathoms water, yet the channel is too narrow and intricate for any but very small vessels. This Arm is about a quarter of a mile wide for the first 5 miles, or up to Barnaby island ; after which it varies from 1 to 2 cables up to the rapids, 12 miles from Beaubère island. There is an Indian village on the north shore at the rapids, where the river is not more than half a cable wide. Both shores of this Arm are settled, and many of the farms appear to be in a flourishing condition.

TIDES.—The tide, which ends at the rapids, was observed to rise 2 feet there, and it was high water on the day of the full moon at about 8h. ; as it was also at the foot of the rapids in the North-west Arm.

CHAPTER XV.

GULF OF ST. LAWRENCE; SOUTH-WEST COAST,—COAST OF NEW BRUNSWICK; ESCUMENAC POINT TO BAY VERTE INCLUSIVE.

VARIATION 21¾° West in 1860.

THE remaining part of the coast of New Brunswick, within the Gulf, extends from Escumenac point to Bay Verte, and forms the south-west shore of the Strait of Northumberland, for a distance of 80 miles. It will be useful to give a description of the features, rivers, harbours, and dangers of this coast, and of the succeeding coast of Nova Scotia, as well as of the opposite shore of Prince Edward island, before the Strait itself is described, or directions given for its navigation.*

SAPIN POINT and LEDGE.—Escumenac point, with its lighthouse and reef, has been already noticed in page 28; from this point a low and shallow shore trends S.S.W. 5½ miles to Sapin point.

The Sapin ledge of sandstone, and with 12 feet least water, is very dangerous, lying directly in the way of vessels running along shore. It should not be approached nearer than the depth of 9 fathoms in the night-time; and at all times it should be remembered, that the 5-fathoms line of soundings is distant from it only about 2 cables. The ledge is 1¼ miles long, east and west, and about half a mile wide, from the depth of 3 fathoms to 3 fathoms; and its eastern or outer extremity bears South 6 miles from the lighthouse on Escumenac point, and E. by S. ½ S. 2½ miles from Sapin point. There is a depth of 3½ fathoms between it and the last named point.

KOUCHIBOUGUAC BAY is nearly 20 miles wide in a S. by W. direction, from Sapin point to Richibucto head. Its shores are exceedingly low, with sand-bars and beaches, inclosing, extensive and shallow lagoons, through which the rivers flow to the sea. The shoal water (depths not exceeding 3 fathoms) extends off shore to a considerable distance in the north-western part of this bay; and there is foul ground, with as little as 3 fathoms water, more than 2 miles out to the eastward, from the mouth of the Kouchibouguac river. North-east gales send a heavy swell into the bay, so that it will be prudent not to get embayed there, especially at night, or in a dull sailing vessel.

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* *See* Chart :—Gulf of St. Lawrence, Sheet 8, No. 1,747.

KOUCHIBOUGUAC RIVER, after flowing for more than a mile through an extensive lagoon, nearly dry at low water in spring tides, enters the sea by an outlet through sand-bars about 9 miles S.W. from Sapin point. Its bar of sand not unfrequently shifts in heavy easterly gales ; and the channel is at all times narrow and intricate.

A depth of 9 feet at high water and spring tides could be carried in over the bar at the time of the Admiralty survey in July 1839. The tides rise from $2\frac{1}{2}$ to 4 feet, flowing about 8 miles up the river, and affording a depth of from 2 to 3 fathoms through a very narrow and crooked channel, for a distance of 5 miles in from the bar. It was high water at the full and change, in July at about 4 a.m., but the "diurnal inequality," belonging to two interfering tides, caused the p.m. tide to nearly disappear.

Large ships, which are occasionally built in this river, are taken out light, and towed by a steamer to be fitted at Richibucto or Miramichi. The banks of this river are well settled, and there is a saw-mill at the head of the tide.

KOUCHIBOUGUACSIS RIVER is nearly similar in all its characters to the Kouchibouguac, having, like the latter, a course of 40 or 50 miles, but becoming rapid, shallow, and consequently unnavigable, above the point reached by the tide. It has saw and grist mills, and settlements of Acadian French on its banks. Of its two outlets through the sand-bars, the most northern, 3 miles southward of the Kouchibouguac, is only fit for boats, the channel leading to it through the lagoon having become nearly filled up with sand and weeds.

The river, after entering the lagoon, and running for some distance towards this outlet, turns to the southward, and continues its course within the sand-bar for a distance of 3 miles to the southern and main outlet, which is called Big cove, and is 6 miles south of the Kouchibouguac, and 3 miles north of the Richibucto river. The depth by a narrow channel, over the shifting bar of sand, is 9 or 10 feet at high water in spring tides. There are 3 fathoms just within the sand-bars, from 1 to 3 fathoms through the lagoon, and 2 or 3 fathoms for several miles up the river. There is a communication by boats at high water through the lagoons, and within the sand-bars, not only between the two rivers just described, but also southward to Richibucto, and northward nearly to Marsh river, a distance in all of nearly 15 miles.

RICHIBUCTO RIVER is of very superior importance to those rivers just described : being, among the rivers on this side of New Brunswick, inferior only to the Miramichi, either in the distance to which it is navigable, or in the depth of water over its bar. It is annually visited by a considerable number of vessels for cargoes of lumber. There are flourishing and rapidly increasing settlements on its banks, as well as on

those of its principal tributaries, the Aldouin, the St. Nicholas, and the Molus or Molies rivers, of which, as being of no nautical importance, it is unnecessary here to speak particularly. The population of English, Scotch, Irish, and Acadian extraction, are engaged in agriculture, lumbering, and ship-building; but they do not prosecute the fisheries. Traces of coal are reported to have been found in the sandstone, which forms the substratum of this and of all the neighbouring country. In the year 1856, 77 vessels (11,715 tons) entered inwards, and 78 (16,246 tons) cleared outwards.*

The Aldouin enters on the northern side: about 2 miles within the entrance of the river, and about a mile higher up on the same side, stands the town of Liverpool, containing, in 1839, about 600 inhabitants. It has a church, a chapel, court-house and jail, &c., being the capital town of the county of Kent. There is a church $1\frac{3}{4}$ miles above the town, and opposite to it, on the southern side of the river, the shipbuilding establishment of the Messrs. Jardine, together with a village of Micmac Indians, who are employed by those gentlemen as labourers and choppers, an almost singular instance of even partial success in inducing the aborigines to submit to regular labour.

The entrance of the Richibucto is about $3\frac{1}{2}$ cables wide; it lies between two sand-bars, several miles in length, called the north and south beaches, on which there are sand-hills as high as 30 feet. Immediately within the entrance there is a wide expanse of mud and weeds, nearly dry at low water, excepting the channel of the river. On the northern side, a shallow bay leads, within the north beach, to the lagoons already mentioned (in page 43), whilst on the south side, within the south beach, lies French island; and still farther to the south-east French creek and Low village, where there is a church, visible in some directions from the sea. Within the wide part just mentioned, the breadth of the Richibucto is rendered irregular by numerous bays on either side. Just below the town it is above 4 cables wide, but contracts to $1\frac{1}{2}$ cables at Jardine's establishment, after which it expands again for a considerable distance, and is no where less than 160 yards broad, nearly to the end of the navigation; although the channel between mud-banks, nearly dry when the tide is out, is much narrower. Low cliffs of sandy clay are frequent on either side of the river; but the adjacent country, although undulating, is everywhere of very small elevation, not exceeding 80, or at the utmost 100 feet above the sea.

The Richibucto is navigable for boats nearly to the head of the tide, being a distance of about 22 miles, following the stream; the general

* *See* Plan of Richibuto River, No. 2,199; scale, $m = 4$ inches.

direction being W.S.W. Any vessel that can pass the bar may be taken about 13 miles up the river; the depth in the channel varying in that distance from 3 to 9 fathoms, over mud buttom. Smaller vessels may ascend to within 2 or 3 miles of the head of the tide, where the river is quite shallow and rapid at low water.

The BAR of the Richibucto is extremely dangerous, especially to large, deeply laden, and dull sailing vessels outward bound in the fall of the year. Taking advantage of the highest spring tide, and sailing at high water, if the wind becomes unsteady or too light, they are almost certain to be thrown ashore by the ebb tide, on the south-eastern part of the bar; and should a north-east gale occur, to be destroyed before they can be got off again. To take a ship in with a leading wind and flowing tide, is attended with no other difficulty than that which arises from the narrowness of the channel; but in all cases the assistance of a pilot is absolutely necessary, since the bar is subject to occasional changes from the effect of heavy gales. The bar extends from the north beach, for 2 miles to the E.S.E., parallel to the south beach; there is a rock in the eastern part of it, but the remainder is of sand, dry at low water.

No part of this bar extends to seaward so much as a mile from the shore, and it may be safely approached by the lead to 6 fathoms water, at any time of tide; but for the purpose of anchorage 9 fathoms is a better depth, the bottom being there of fine brown and gray sand, affording far better holding ground than farther in-shore. The situation of the narrow channel over the bar ($1\frac{1}{2}$ miles E.S.E. from the river's mouth) is indicated by two *white* beacons on the south beach, and by a large *black* buoy moored off in $3\frac{3}{4}$ or 4 fathoms at low water, with the two beacons in line, bearing (in 1839) W. by S. $\frac{1}{2}$ S. distant not quite a mile. These beacons in line always lead in over the bar, being shifted as required almost every spring, in consequence of changes in the channel effected by heavy north-east gales. The North beacon, which stands on a sand-hill, 30 feet high, at the south extremity of the north beach, is large and *white*, being intended to point out the situation of the river to vessels many miles out to sea.

The depth of water over the bar is $13\frac{1}{2}$ feet at low water, or $17\frac{1}{2}$ feet at high water, in ordinary spring tides; and there is not a continuously greater depth for the first mile in from the black buoy, the channel being from 100 to 180 yards wide, from 2 fathoms to 2 fathoms, excepting at the turn to the W.N.W., which is the narrowest part, and only 80 yards broad. Farther in, the channel expands in breadth to about 370 yards, increasing in depth to $3\frac{1}{4}$ fathoms; it contracts again to only 100 yards wide at the north beach, where the depth is 5 fathoms, and the stream of tide strongest being about $2\frac{1}{2}$ knots. About half a mile within the North

beacon the channel widens for a short distance to 400 yards, and has 3 to 4 fathoms water in it, with mud bottom. The depth increases farther in, and is nearly 9 fathoms in some places ; but for farther particulars the mariner must refer to the plan which these remarks are intended to accompany.

PILOTS.—The branch pilots of Richibucto river are able, intelligent, and attentive to their duties ; they keep a good look out for vessels from the beacon at the mouth of the river.

Although the assistance of a pilot acquainted with the set of the tides, and familiar with the appearance of every object, is absolutely requisite to ensure safety, yet, in the event of emergency, the following brief directions, with the Admiralty plan, might enable the intelligent seaman to run his vessel in with safety.

DIRECTIONS.—Having made the North beacon, look out for the *black* buoy, and keep outside of it, in not less than 5 fathoms water, until it and the two beacons come in line, bearing about W. by S. $\frac{1}{2}$ S. Then steer in close past the buoy, keeping the two beacons exactly in line, and looking out for the small *white* buoys, which are placed along the southern edge of the bar, and must be left on the right hand going in. Having run in about half a mile with the two beacons in line, the vessel will be within 2 cables of the south beach, and the small white buoys along the south, or inner side of the bar, will be seen to come in one with each other, and with the North beacon bearing W.N.W. Haul up immediately for the latter, passing about 40 yards to the southward of the buoys.

Having run to the W.N.W., between the bar and the south beach, about $1\frac{1}{4}$ miles, and arrived within the distance of about a quarter of a mile from the North beacon, the channel becomes again very narrow, and is marked by small buoys on either side ; but as these buoys might not readily be made out by a stranger, bring the south-west point of the north beach to bear N.W., and steer for it ; observing that the channel, which is then only half a cable wide, passes close to the north beach at the North beacon. As soon as the vessel is abreast the beacon, edge away West and W.S.W. for half a mile, when there will be plenty of room to anchor in quite a secure harbour. The small white buoys just mentioned are merely pieces of wood, painted white, and placed at convenient distances, according to the judgment of the pilots.

TIDES.—At the North beacon, within the entrance of the Richibucto river, ordinary springs rise 4 feet, and neaps $2\frac{1}{2}$ feet. On the day of the full moon in July 1839 there was only one high water, at 3h. 30m. a.m., and one low water, at 4 p.m. But towards the time of neap tides, two high waters in 24 hours became apparent for a few days. There would seem

to be two interfering tides, presenting phenomena which it would require accurate and long continued observations to explain. The rate of the tides in the river is from $1\frac{1}{2}$ to 2 knots.

RICHIBUCTO HEAD.—Off Richibucto point, which is the south-east extreme of the south beach, and $3\frac{1}{2}$ miles from the mouth of the Richibucto, a reef of sandstone extends off shore to the distance of a mile from the high-water mark, and continues 2 or 3 miles farther to the southward, to Richibucto head, which is of sandstone and clay cliffs, 50 feet high.

From Richibucto point, the south-east extremity of the Buctouche sand-bar bears South, and is distant $14\frac{1}{2}$ miles. There is nothing requiring notice in the bay between them, excepting the small Shockpish river, affording shelter to boats at high water.

NORTH PATCH of rocks, with 12 feet least water, is small, with 5 fathoms close outside of it. It lies 2 miles off shore on the north-east point of the Outer bar of the Buctouche, with Cocagne steeple and the north-west extreme of Cocagne island in line, bearing S.S.W. $\frac{3}{4}$ W.; the south end of Buctouche sand bar S.W. by W.; and Buctouche steeple seen over the sand-bar N.W. by W. $\frac{1}{4}$ W. Vessels will pass outside of it, if they do not come into less than 5 fathoms at low water.

OUTER BAR of Buctouche river is a long ridge of sandy and rocky ground, carrying $2\frac{1}{4}$ to $3\frac{3}{4}$ fathoms water, and extending to the southward, and parallel to the shore from the North Patch nearly to Cocagne, a distance of 7 miles. There is a narrow channel between it and the shore, of various depths, from $3\frac{1}{4}$ to 5 fathoms.*

BUCTOUCHE ROAD, off the entrance of the Buctouche river, and in the widest part of the channel within the Outer bar, is quite safe for a vessel with good anchors and cables; the ground being a stiff tenacious clay, and the Outer bar preventing any very heavy sea from coming into the anchorage. It is here that vessels, of too great draught of water to enter the river, lie moored to take in cargoes of lumber. In approaching this anchorage, there is nothing in the way of vessels that do not draw too much water to pass the Outer bar, excepting the North Patch; but larger vessels will find more water (not less than $3\frac{1}{2}$ fathoms) by approaching from the northward, according to the following directions.

DIRECTIONS.—Being off the coast with a leading wind, bring Buctouche steeple to bear to the southward of West, and run in shore with it on that bearing, in order to pass to the northward of the North Patch.

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* *See* Plan of Buctouche River, No. 1,986; scale, $m = 3$ inches.

In running in, if the weather be favourable, Cocagne steeple will be observed to open out to the westward of Cocagne island, so as to be seen between the latter and the main land; the course must be continued till the steeple comes in line with the extreme of Dickson point, which is a small, low, and rocky peninsula of the main land, $2\frac{1}{2}$ miles to the southward of Buctouche sand bar. Alter course immediately, running with Cocagne steeple and Dickson point in line, bearing S.S.W. $\frac{1}{2}$ W., and they will lead close inside the Outer bar, and clear of a small shoal, which lies between it and the shore, and on which there are not less than $2\frac{3}{4}$ fathoms. Take care not to shut the steeple in behind Dickson point, as the vessel runs along the sand bar, and immediately after Buctouche steeple opens out to the westward of the small sandy islet which forms the south-west point of Buctouche sand bar, two *white* beacons on the main land will be observed come in one, bearing N.W. by W. $\frac{1}{2}$ W.; anchor with them in one, and Cocagne steeple open about its own breadth to the left or eastward of Dickson point, and the vessel will be in the best berth in $3\frac{3}{4}$ or 4 fathoms at low water, and with excellent holding ground. It may happen that the state of the weather may prevent the leading mark from being distinguished, but even in that case the Admiralty chart and the lead should be sufficient guides.

BUCTOUCHE RIVER enters the sea to the south-east, through the shallow bay within the Buctouche sand bar. The two *white* beacons just mentioned, as pointing out the best anchorage in the roadstead, are intended to lead in over the bar of sand and flat sandstone, in the greatest depth, namely, 8 feet at low, and 12 feet at high water in ordinary spring tides. But the channel is so narrow, intricate, and encumbered with oyster beds, that written directions are as useless as the assistance of a pilot is absolutely necessary to take a vessel safely into the river. Within the bar is a wide part of the channel in which vessels may ride safely in $2\frac{1}{2}$ and 3 fathoms over mud bottom; but off Giddis point the channel becomes as difficult, narrow, and shallow as at the bar. It is in its course through the bay that the Buctouche is so shallow and intricate; higher up its channel is free from obstruction, and in some places has 5 fathoms water. Having crossed the bar, a vessel may ascend about 10 miles farther, and boats 13 or 14 miles, to where the tide water ends. One mile above Buctouche church there is a bridge, but it is so constructed as to permit the vessels to pass, which are built higher up the river. There is also a bridge over the southern and smaller branch.

The country on either side of the Buctouche is considerably higher than at Richibucto, the ridges attaining an elevation of about 200 feet above the sea. The banks of the river are well settled, principally by Acadians, and the clayey soil is very fertile. There are saw and grist mills at the

head of the tide. A few vessels are built in the river annually, and several sail from Great Britain visit it for lumber ; but it is at present a place of no great trade. In the year 1856, 41 vessels (5,888 tons) entered inwards, and 51 vessels (6,306 tons) cleared outwards.

COCAGNE HARBOUR, 6 miles south of the Buctouche, has its entrance to the southward of Cocagne island, and between it and Renouard point, the latter being formed of reddish sandstone cliffs 50 feet high. It is a very small harbour, and the channel over the bar, of sand, gravel, and sandstone, is narrow and crooked, with 10 feet at low, or 14 feet at high water in ordinary spring tides. Within the bar there are from $2\frac{1}{2}$ to 4 fathoms, in a very narrow channel, for a distance of about three-quarters of a mile ; and it is here that a vessel or two lie moored every year to take in lumber. Farther in, the bay is shallow, with oyster beds and mud flats, covered with from 4 to 6 feet water. To enter this harbour, fine weather and a good pilot are absolutely necessary.*

Cocagne river enters the head of the bay half a mile to the southward of the church, and 3 miles W.S.W. from the harbour's mouth. It is crossed by a bridge just within its entrance, and is navigable by boats for several miles. The shores of the river and bay are well settled, by families of Acadian and British extraction, engaged in agriculture, together with lumbering and ship-building to a limited extent.

SHEDIAC BAY.—Shediac point is a low sandstone cliff, nearly 4 miles to the southward of Cocagne ; and nearly 10 miles S. $\frac{1}{2}$ E. from the south-east point of Buctouche sand-bar. The Grandigue bank, with from 14 to 18 feet water, extends off it to the distance of 2 miles, having the least water near its outer edge. This extensive rocky bank is dangerous to vessels of large draught, which, however, will pass outside it, if they do not approach the shore nearer than the depth of 5 fathoms at low water.†

Shediac bay is $6\frac{1}{2}$ miles wide from Shediac point to Bouleaux point (Birch point), and about 5 miles deep. On its north side will be seen the church, and village of Upper Grandigue ; and along the head of the bay, within the island, the village of Shediac, with its small church. There is less than 3 fathoms water in the greater part of this bay ; it is therefore unsuited to large vessels, and it is rendered dangerous to strangers by the shoals about to be described. There is good anchorage under its north point, in north and north-west winds, in 17 or 18 feet, mud bottom.

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* *See* Plan of Cocagne Harbour, No. 1,941 ; scale, m = 3 inches.

† *See* Plan of Shediac Bay and Harbour, No. 1,943 ; scale, m = 3 inches.

MEDEA and ZEPHYR ROCKS.—The Medea rock is very small, with 6 feet least water: there are 3 and 4 fathoms water around it, at the distance of a cable's length, excepting to the southward, in which direction there are several rocky patches, with 12 feet water, between it and the shore, which is distant from it nearly $1\frac{3}{4}$ miles. This dangerous rock lies 2 cables within the line joining Shediac and Cocagne points, with Hannington's house just open to the southward of the low sandy south-west point of Shediac island, bearing West, and Chêne point (Oak point), the south point of entrance of the harbour, W. by S. $\frac{1}{2}$ S., $2\frac{1}{2}$ miles.

The Zephyr rock is also very small, with 9 feet least water, and lies rather more than a mile W.N.W. from the Medea rock. When on it the English church will be seen over, and shut in two or three times its own breadth behind the sandy south-west point of Shediac island, bearing W. by S.; the north-east point of Shediac island N.W. $\frac{1}{4}$ N.; and Chêne point S.W. $\frac{3}{4}$ W. It is distant from the south-east point of the island, which is the nearest part of the shore, a long mile. There are from 14 to 22 feet of water between the Medea and Zephyr rocks, but the best channel is to the north-west of them both.

SHEDIAC HARBOUR is the easiest of access and egress on this part of the coast, being the only one which a vessel in distress can safely run for, as a harbour of refuge. It is superior to Buctouche and Cocagne, in the depth of water over the bar, and it is also much more extensive within than the latter; the space in which shipping may be moored, in from 12 to 17 feet at low water, being three-quarters of a mile long, and from $1\frac{1}{2}$ to 3 cables wide. The depth that can be carried in by a good pilot is 14 feet at low water, and 18 feet at high water in ordinary spring tides; and the bottom in the channel is of mud, as it is also in the harbour within.

Although a slight swell may be felt in this harbour at high water, in a north-east gale, yet it is never sufficient to endanger, in the slightest degree, a vessel with good anchors and cables. Even in the bay just outside the bar, a vessel would ride safely in any gale not unusually strong for the summer months. The harbour lies between the south-west point of Shediac island and Chêne point; the latter bearing from the former S.S.E. three-quarters of a mile. From Chêne point a sandy bar runs out 8 cables to the northward, and is dry for nearly half that distance at three-quarters ebb. It is this bar, together with the shoal farther out, off the south-east point of Shediac island, which renders the harbour so secure.

The entrance between the north point of the bar and the edge of the shoal water off the island is the narrowest part of the channel, and only

$1\frac{1}{4}$ cables wide, from the depth of 12 feet to 12 feet on either side; moreover, there are two or three very small patches, perhaps ballast heaps, of 11 or 12 feet water, which can only be avoided by the pilots for the place. They generally place stakes and buoys for their own guidance, and according to their own judgment, every year; and their assistance should always be sought. But in case of necessity, when no pilot can be procured, the following directions, together with the Admiralty chart, will be sufficien guidance to a vessel requiring no more than the depth of 11 feet at low water, which is all that can be insured without a pilot, or one acquainted with the buoying or staking of the channel.

DIRECTIONS.—Being in the entrance of Shediac bay with a leading wind, bring the English church open its own breadth, clear of the south extreme of the trees of Shediac island, bearing W. by S. $\frac{1}{2}$ S.; and keep it so in running towards it, until Grandigue church and the north-east point of Shediac island come in line, bearing N.W. by N.; then steer instantly for Chêne point, which will bear about S.W. $\frac{1}{4}$ S. Run half a mile on that course, when the English church will be in line with the end of the grass, on the sandy south-west point of Shediac island, bearing W. by S., and must be immediately steered for. Keep the south side of the church, and the south extreme of the grass in line, taking care not to open out the church in the least, and when the vessel has run nearly half a mile on that course, the south-east and north-east points of Shediac island will come in one, bearing N. $\frac{3}{4}$ E., and she will then be on the north extreme point of the bar, in 12 or 13 feet at low water.

Continue the course for the distance of a cable after the last named cross marks come on, and perhaps the weather will be clear enough for the low sandy Grandigue point to be made out, which will then come in one with the south-east point of Shediac island, bearing N. by E.; but if not, endeavour to judge when the above short distance is run, and then quickly alter course to S.S.W., or so as to have Chêne point a very little on the port bow. Having run $2\frac{1}{4}$ cables S.S.W., Indian island will open out to the westward of the south-west extreme of the trees on Shediac island, and will be seen over the low spit which forms the sandy south-west point of the island. Run on about a cable farther, and the sandy west point of Shediac island will open out clear of the south-west extreme of trees, bearing N.W. by N., and will be seen over the spit in like manner, when the vessel may anchor in 14 feet at low water; or, if more room is required, run $1\frac{1}{2}$ cables S.W. by W., and anchor there in the same depth of water. The foregoing directions will lead to the northward of the Zephyr rock, and between it and the shoal off the island, which is considered the safest route for a stranger. The harbour is much more extensive for vessels of light draught than has been men-

tioned, although encumbered by ballast heaps; and vessels drawing 7 or 8 feet may be taken through the bay within the island to the wharf at the village.

SHEDIAC, although well situated, is not yet a place of much trade. In the year 1856, 149 vessels, amounting to 21,760 tons burthen, entered inwards, and 152 vessels, 23,377 tons, cleared outwards. The Shediac and Scoudouc rivers, in the north-west and south-west corners of the bay respectively, are small streams navigable for boats for a few miles, to saw mills at the head of the tide. There are bridges across each of these streams near their mouths, where there are oyster beds, as there are also, together with other shell fish, in many parts of the bay.

The country about Shediac is fertile and well settled, consisting of undulating ridges of clayey loam, attaining the extreme height of 150 feet, and resting on the sandstone of the coal formation. There is a good road across from Shediac to the village of Monckton, at the bend of the Petticodiac river, the distance being 14 miles: and this is one of the places where it has been proposed to connect the waters of the bay of Fundy and the Gulf of St. Lawrence by a canal, the practicability of which will perhaps be found to depend on the possibilty or otherwise of finding the requisite supply of water from a sufficiently elevated source. Meanwhile a railroad has now been completed across to Monckton, and is intended to be continued until it connects with other New Brunswick lines, leading to St. Johns, &c.

TIDES.—The tides at Shediac, when unaffected by winds, rise 4 feet in ordinary springs, and 2 feet in neaps; and the rate of the stream of either ebb or flood seldom exceeds half a knot. In the month of August there occurred two high waters, on the full and change days, at 1h. and 8h. a.m.; but there was only one low water, at 4h. 30m. p.m.; for although the tide did in general fall a little between the two high waters, yet it was usually only a few inches, and seldom more than a foot.

BOUCHAGAN and KOUCHIBOUGUET RIVERS, in the sandy bay between Bouleaux point and Cape Bald, and $6\frac{1}{4}$ miles eastward of Shediac, are small, and can only be entered by boats at high water.

Off Bouleaux point a reef extends more than a mile from the shore; but Cape Bald, which is of sandstone cliff, 40 feet high, and 11 miles eastward of Shediac island, is bold, and may safely be approached by the lead to the depth of 5 fathoms.

GREAT and LITTLE SHEMOGUE RIVERS, 7 miles and $9\frac{1}{2}$ miles respectively to the S.E. by E. of Cape Bald, are only fit for boats and very small vessels, having narrow and intricate channels, over shifting

bars of sand. At the time of the Admiralty survey, 10 feet could be carried in over the bar of the former, and 8 feet over that of the latter, in spring tides. There is good anchorage, in 5 or 6 fathoms sandy bottom, off these rivers, in the bay between Cape Bald and Cape Bruin, the latter bearing from the former S.E. by E. nearly 13 miles.

CAUTION.—In the distance just named the coast is free from danger, the shoal water extending only about half a mile off shore; and a vessel may safely approach at night to the depth of 6 fathoms at low water. But farther to the eastward greater caution will be requisite, on account of the dangerous shoals which commence off Peacock cove, which is in the bay between Cape Bruin and Cape Jourimain.

CAPE TORMENTINE is a name sometimes applied to the whole, and sometimes to different points, of the great headland which forms the eastern extremity of New Brunswick, within the Gulf, and which separates Bay Verte from the rest of the Strait of Northumberland. But it is here restricted to the comparatively high central point, to which the inhabitants also seem to confine it; and again, in conformity with their usage, as well as for precision of description, the names of Indian point and Cape Jourimain have been adopted for the southern and northern extremities of this promontory, which is a place of great importance in a nautical point of view, not only from its position, but from its dangerous and extensive shoals.

Cape Jourimain, the north extreme of the Jourimain islands, forms the extreme point of land to vessels running through Northumberland Strait, either from the eastward or westward. It bears S.E. by E. $\frac{1}{2}$ E. $6\frac{1}{2}$ miles from Cape Bruin; and there is good anchorage in the bay between them, in 5 fathoms sandy bottom, and in winds from the S.E. by E., round south, to W. by N. The islands are connected together, and with the mainland, by sand-bars and marshes; but still they appear as islands when seen from a distance sufficient to sink the sand bars below the horizon.

JOURIMAIN SHOALS are extremely dangerous to vessels running at night without their leads going; they commence at Peacock cove, off which there is a patch of $3\frac{1}{2}$ fathoms, at 2 miles off shore. They extend from Cape Jourimain $1\frac{1}{2}$ miles to the N.N.W.; and there is a patch of 4 fathoms, $1\frac{3}{4}$ miles North from the same point; from their north-west extreme they extend S.E. $4\frac{1}{2}$ miles. They are of sandstone, thinly and partially covered with sand; and their south-east point, a narrow ridge with only 6 feet at low water, and distant $1\frac{3}{4}$ miles from the shore, is the most dangerous, because the boldest part of the shoals. It should not be approached nearer than the depth of 9 fathoms in the night-time; but farther westward the shoals may be neared with proper caution to 6 fathoms at low water.

ANCHORAGE.—To the southward of the Jourimain shoals, and between them and the Tormentine reefs, there is good anchorage with westerly winds, in from 5 to 6 fathoms, the bottom being of sand, with clay underneath.

TORMENTINE REEFS are also extremely dangerous, and are rendered doubly so by the strong tides. They extend off Indian point rather more than 3 miles to the E.S.E., and there is rocky ground with 4 fathoms fully a mile farther off shore. The part of these reefs which dries at low water is very small, and bears E. by S. $\frac{1}{2}$ S., $2\frac{3}{4}$ miles from Indian point. It lies about $1\frac{1}{2}$ cables to the southward of the line joining Cape Spear and the south side of Ephraim island; and the whole of that island open to the southward of Cape St. Laurent will lead more than a mile to the southward of it; but these marks are not of much use, nor are there any others that can be depended upon, for the north extreme of the trees of the inner Jourimain island, and the south extreme of the trees of the outer Jourimain island touching, which is the mark that now leads well clear of the reef to the northward, will change as the woods are cleared away. The only sufficient guides, therefore, are the lead and the Admiralty chart.

Vessels running through Northumberland Strait at night, or at any time without a commanding breeze, should not approach this reef from any direction between North and East nearer than 9 fathoms water; for the flood tide sets over it to the southward, into the Bay Verte, at the rate of 3 knots, causing a great rippling over the part that dries, and generally indicating its position. Nearly midway between the dry part of the reef and Indian point there is a patch of rocks with 7 feet at low water. Small craft carry a depth of $2\frac{1}{2}$ fathoms at low tide through between that patch and Indian point, and often take shelter under the latter in northerly winds; but large vessels, wishing to do the same, must run round outside the whole of the reef, and will find the soundings in the chart a sufficient guide.

DIRECTIONS.—To run through the $2\frac{1}{2}$ fathoms channel between Indian point and dry part of the Tormentine reefs:—Bring Indian point and Cape Spear in one, bearing W.S.W., and run towards them, until the east extreme of Cape Tormentine touches the west side of the outer Jourimain island, bearing N.N.W ; then alter course, and run to the S.S.E., with the last named marks on astern, until the water deepens to 5 fathoms at low tide, when the vessel will be to the southward of the reefs.

BAY VERTE is 9 miles wide across its entrance, from Indian point in New Brunswick, to Cold Spring head in Nova Scotia, but contracts to the breadth of $2\frac{1}{2}$ miles near its head. It is 11 miles deep, and separates the two

provinces which have just been named ; their boundary continuing across the isthmus from the head of Bay Verte to Cumberland basin, a distance of about 11 miles. This isthmus, connecting Nova Scotia with the rest of North America, is said to be low, and to afford an advantageous level for the construction of a canal, which may unite the waters, and facilitate the traffic between the Bay of Fundy and the Gulf of St. Lawrence ; but if ever such a work be undertaken, it will be necessary to form a harbour in addition, for there is none in Bay Verte, which is completely open to easterly winds, as well as very shallow near its head, where flats of mud and weeds dry out to a distance of three-quarters of a mile from the shore.

In the northern corner of the head of the bay is the Gaspereaux river, a small stream, only fit for boats ; and half a mile to the southward of its mouth, on Old Fort point, the remains of Monckton fort are still to be seen, though now washed by the sea.

The river Tignish is the most considerable stream in Bay Verte, which it enters on the south side near its head. It has only 3 feet depth of water, in a very narrow channel, when the tide is out ; and it is approached by a narrow channel, carrying 3 to 7 feet, through flats of mud and weeds, which dry out a mile from its mouth. The river is crossed by a bridge $2\frac{1}{4}$ miles up from its entrance, following the windings of the river; and about 3 miles farther up, the tide is limited in its ascent by Toby's mill; though, before the mill was built, it flowed $1\frac{1}{2}$ miles farther. The spring tides rise 9 feet, and the neap tides 5 feet. About 100,000 deals are said to be annually rafted down this river, from whence they are for the most part taken in small schooners, or in rafts along shore, to Pugwash, to be shipped for the British market.

There are thriving settlements on either side of Bay Verte, and especially at its head, where extensive tracts of meadow land have been formed by dyking out the tide.

DANGERS in BAY VERTE.—Bay Verte was formerly erroneously represented as being free from danger, with mud bottom shoaling gradually to its head. The Admiralty survey has in great part deprived it of that character, by the discovery of the following dangerous rocky shoals lying directly in the way of vessels entering the bay.

Spear Shoal, having a patch of rock with 10 feet least water near its east end, and from 15 to 18 feet in other parts, is a bank of sand and stones, resting on sandstone, about a mile long, in an east and west direction, and a third of a mile broad. From the shoalest part Cape Spear bears N.W. by N. $1\frac{3}{4}$ miles, and Indian point N.N.E. $2\frac{1}{4}$ miles. The lead gives little warning in approaching this dangerous shoal from the eastward, on

which side there are from $3\frac{3}{4}$ to $4\frac{1}{4}$ fathoms close to; but vessels will avoid it by coming into no less water than $4\frac{1}{2}$ fathoms, as they pass to the southward of it. There are $3\frac{1}{4}$ fathoms of water between it and Cape Spear.

Heart Shoal, lying about a mile W.N.W. from the Spear shoal, and S.W. by S. $1\frac{1}{4}$ miles from Cape Spear, has 9 feet least water, and 15 feet between it and the shore; but as it lies within the 3-fathoms line of soundings, it will be sufficient to refer to the chart, in addition to having pointed out its position.

Laurent Shoal, of rock and sand, with 16 feet least water, is about three-quarters of a mile long, by half that breadth. From the shoalest part Cape St. Laurent bears N.W. by N. $2\frac{3}{4}$ miles, Ephraim island N.W. $\frac{1}{2}$ W., Indian point N.E. by E. $\frac{1}{4}$ E., and Cold Spring head S.S.W. $\frac{1}{2}$ W. This shoal is also bold on the east side, where there are $4\frac{1}{4}$ fathoms close to.

Aggermore rock, with 18 feet least water, and bearing N.E. $\frac{1}{2}$ E., $2\frac{3}{4}$ miles from Cold Spring head, is, like the Laurent shoal, merely one of the shallowest points of an extensive rocky bank, which is thinly covered with mud and sand, and which extends out from Cape St. Laurent and Ephraim island, in a S.E. by S. direction, so as to leave a deep channel, about 2 miles wide, between it and Cold Spring head. At low water not more than $3\frac{1}{2}$ fathoms could be safely reckoned upon, in running between the Aggermore rock and the Laurent shoal, or between the latter and the Ephraim banks, extending off the northern shore; and even that depth could only be insured by the assistance of the chart, for there is not more than 19 feet in several parts of these banks.

DIRECTIONS.—Vessels bound up the Bay Verte should keep the Nova Scotia coast aboard, running up in $6\frac{3}{4}$ and 7 fathoms water, till they arrive off Cold Spring head, where, at the distance of about $1\frac{1}{2}$ miles from the shore, they will find the water deepen to 8 or 9, and even nearly to 10 fathoms, as they pass to the southward of the banks and shoals which have been described. After passing Cold Spring head about 3 miles, the depth of water decreases to less than 5 fathoms, and continues to shoal gradually, with mud and sand bottom, to the head of the bay. A reference to the chart will show the general extent of the shoal water off the shore; but the Boss spit, which extends three-quarters of a mile from the south shore between Boss and Jackson points, and $3\frac{1}{4}$ miles to the north-west from Cold Spring head, is dangerous, as it dries out to its edge, and is so steep to, that there are 17 feet water close to its outer point. Vessels should be careful not to go into less water than $3\frac{1}{4}$ fathoms, until they are past this sand-spit. Farther up the bay there is nothing

in the way, excepting two patches of stone with 3 and 5 feet water, at the distance of half and three-quarters of a mile N.N.E. ½ E. from Tignish head. These are perhaps ballast heaps, of which there are several at the entrance of the channel of the river; but as these are all within the 2-fathoms line of soundings, they require no farther notice.

CHAPTER XVI.

GULF OF ST. LAWRENCE; SOUTH-WEST COAST,—COAST OF NOVA SCOTIA, BAY VERTE TO CAPE GEORGE.

VARIATION 22° West in 1860.

FROM Cold Spring head, the south point of entrance of Bay Verte, there is no place of use to shipping for a distance of 10 miles, or to the contiguous rivers Philip and Pugwash, in the bay between Lewis head and Pugwash point. The last named point bears from the former E. by S. $2\frac{1}{4}$ miles; and there are reefs off both of them which render the approach extremely perilous to strangers.*

LEWIS REEF extends N.E. $2\frac{1}{2}$ miles from Lewis head; its outer part is composed of detached rocky patches, on which there are from 14 to 18 feet water, with a greater depth between them; but the inner part is shallow, and has as little as 6 feet water at the distance of $1\frac{1}{2}$ miles from the shore.

PUGWASH REEF extends three-quarters of a mile N.W. by W. from Pugwash point, and dries out about half that distance. There are rocky patches, with 11 and 12 feet water, three-quarters of a mile off the point to the North and N.E.; and others farther to the eastward, a full mile out from the shore; moreover, there is uneven rocky ground, with a less depth than 4 fathoms, 2 miles off shore, and which renders it unsafe for a stranger in a vessel of large draught to go within the depth of 5 fathoms.

PHILIP RIVER enters the sea immediately to the southward of Lewis head, and between the latter and Bergeman point. Its mouth is three-quarters of a mile wide, but a dangerous bar of sand and stones stretches across it, so as to leave only a narrow and tortuous channel of 8 feet at low water, through which the new vessels, built up the river and brought down light, are taken with difficulty on their way to Pugwash, where they take in their cargoes, and where also the lumber and produce brought down this river are taken to be shipped. Within the bar a depth of 12 feet at low water can be carried up the river to the distance of 5 miles, and there are in some places 4 and 5 fathoms; the channel, between flats of mud and weeds, being, in some parts, not more than 40 or 50 yards wide.

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* *See* Chart:—Gulf of St. Lawrence, Sheet 9, No. 2,034; scale, $m = 0{\cdot}28$ of an inch.

Boats can easily ascend about 9 miles, at which distance the tide ends, and there is a slight rapid. The quantity of fresh water discharged is very small, excepting in spring and autumn. There are increasing settlements on either shore of this river.

PUGWASH ROAD, in the entrance of Pugwash bay, affords excellent anchorage, in from 16 to 19 feet at low water, with sand and clay bottom, being sheltered by Philip bar and Lewis reef from West and N.W., and by Pugwash reef from East and N.E. winds. This anchorage is exposed between N.N.W. and N.N.E., but the shallow water outside prevents any sea from coming in sufficient to endanger a vessel during the summer months.

DIRECTIONS.—To run for Pugwash road from the northward, the vessel being in not less than 5 fathoms water, bring the English church-steeple at Pugwash so as to be seen over and only just within the west extreme of the low cliff of Fishing point (the east point of the bay) bearing S. by E. $\frac{1}{2}$ E.

Run towards those marks, taking care not to open out the church in the least to the westward of the point until Bergeman point (the south point of entrance of the river Philip) bears S.W. by W., or until the depth decreases to $3\frac{1}{2}$ fathoms at low water. The vessel will then be close off the north-west end of the Pugwash reef, and must steer S.S.W. for three-quarters of a mile, when she will be in from 16 to 19 feet at low water, with clay bottom, directly in the line joining Bergeman and Pugwash points, and with Fishing point E. by S. $\frac{1}{2}$ S. distant nearly half a mile. This is the best anchorage ; but vessels may lie half a mile farther in to the southward, or close off the bar, in 14 feet at low water. Still farther in the bay is all shoal, excepting the narrow channel, which curves round its eastern side, and leads to the harbour.

To run for Pugwash road from the eastward, the vessel being in more than the low-water depth of 5 fathoms, bring Bergeman point to bear S.W. by W., and steer for it until the church opens out to the westward of Fishing point, when immediately alter course to S.S.W., and, having run nearly three-quarters of a mile, anchor in the same berth as before directed.

PUGWASH HARBOUR, at the head of the bay and entrance of the river of the same name, is small but quite secure, and has more than sufficient depth of water for any vessel that can pass the bar, on which the depth is 14 feet at low water, in ordinary spring tides. The bar is about half a mile within the entrance of the bay, and a crooked channel, from half to one cable wide, and through flats of sand and weeds, for the distance of one mile, leads from it to the harbour's mouth. No directions

would avail for this channel, and the assistance of one of the able pilots of the place is indispensable, and will be readily obtained in answer to the usual signal.

The town or village of Pugwash, with its wharves and small wooden English church, stands on the east side of the entrance of the harbour. Immediately within there is a fine little land-locked basin, with a depth of nearly 7 fathoms, in which vessels lie moored in security, to take in cargoes of lumber that are brought down the river.

PUGWASH RIVER, immediately within the harbour, expands into a small lake, 1½ miles long and 1 mile wide, in which there are several small islands and peninsulas forming scenery of considerable beauty, especially when viewed from the summit of Oxley point, at the inner side of the town. The channel through the lake, and between flats of mud and weeds, nearly dry at low water, is from half to one cable wide, and has 2½ to 6 fathoms water in it. On the western side, the narrow channel of Lime creek leads to quarries of limestone, unfit for building, but which supply Prince Edward island as well as the neighbouring country with lime. The river continues navigable for small vessels about 2 miles above the lake, and for boats to a distance of 7 miles from its entrance. Before the timber was so much exhausted, Pugwash was visited annually by a considerably greater number of vessels than at present. The number is now reduced to ten or twelve sail, exclusive of several new vessels which are built there every year.

The decrease of the timber trade will, however, soon be compensated by the increase of the settlements and an improved agriculture. There are no fisheries here of any consequence, the salmon having become scarce, and the gaspereaux less plentiful than formerly. A few cod-fish are caught off the coast in spring or early summer.

There is no good watering place at Pugwash, the supply from wells, or from springs which are frequently dry in summer, being too limited for the wants of a ship of war.

TIDES.—At Pugwash it is high water, full and change, at 10h. 30m., and ordinary springs rise 7 feet, and neaps 4 feet. The rate of the tidal streams, which is greatest in the entrance of the harbour, does not exceed 2 knots, unless it may be the ebb in the spring after the melting of the winter's snows; in Pugwash road it seldom exceeds a knot.

The COAST from Pugwash point trends E.S.E. 9 miles to Cape Cliff, and 3 miles farther S.E. is Oak island, formerly called Fox island. The intermediate coast is unbroken, and for the most part composed of clay and sandstone cliffs, of the height of 50 feet, from which the land rises to the summit of a ridge 150 feet high. It terminates in Mackenzie point, which

is separated from Oak island by sand bars and a gully for boats nearly dry when the tide is out. There are numerous and flourishing farms along this part of the coast and the ridge just mentioned ; they belong, for the most part, to Scotch highland emigrants, and are termed the Gulf Shore Settlement.

Oak island is low, for the most part wooded, and about a mile long, having Jerry island, small and wooded, a long half a mile to the westward of it, and on the north side of Fox bay, just within Mackenzie point.

FOX HARBOUR.—Within or to the southward of Oak island a bay runs in to the westward about 2 miles, to Mullin point, which separates Fox harbour on the north-west from Wallace harbour (formerly Ramsheg) on the south-west. Fox harbour runs in 3 or 4 miles to the north-west, with a channel through flats of tenacious red clay and weeds, which are nearly dry at low water. There are 3 or 4 fathoms water in this channel ; but a depth of 8 or 9 feet is all that can be carried over the bar at low water in ordinary spring tides.

WALLACE HARBOUR is the finest on this coast, excepting Pictou, having 16 feet over its bar at low water in ordinary spring tides, which rise 8 feet, so that it is capable of admitting vessels of large draught. Its entrance, $2\frac{1}{2}$ miles W. by S. $\frac{1}{2}$ S. from Oak island, and between two sandy spits, named Palmer and Caulfield points, is nearly 2 cables wide and carries $6\frac{1}{2}$ fathoms water ; but the approach to this entrance, over the bar and through the bay for a distance of 3 miles, is by a crooked channel, which, although nowhere less than $1\frac{1}{2}$ cables wide, is, nevertheless, difficult without the aid of buoys or sufficient leading marks. The services of the pilots of the place will, therefore, always be necessary to insure safety; nevertheless, as cases may occur in which their aid could not be obtained, the following description and directions are given to enable the intelligent seaman, furnished with the Admiralty chart, to take his vessel into safe anchorage within Oak island bar, or even to the harbour, should he so prefer.*

Wallace, a prettily situated straggling village with its Kirk, stands on the southern shore, $1\frac{1}{2}$ miles within the entrance of the harbour. The land rises gradually in the rear to the summit of a ridge extending to the eastward, and attaining the elevation of 400 feet. Opposite Wallace the harbour or river is more than half a mile broad, whilst the channel between the flats is only 60 or 70 yards wide, and with 5 or 6 fathoms water. At the distance of 2 miles higher up, the river is divided into two branches, both of which are rendered narrow and intricate by oyster

* *See* Plan of Wallace Harbour, No. 2,003 ; scale, m = 3 inches.

beds in the channels. The navigation of the North branch is terminated, 4½ miles above Wallace, by an immense dyke or dam, 600 feet long, and constructed for the purpose of forming extensive hay meadows. The South and principal branch has a bridge over its entrance, 2 miles above Wallace; it has steep banks of clay and sandstone, and is navigable 6 miles farther to the end of the tide, where, at the time of the survey in the month of August, the bed of the river was nearly dry, and a dam about to be constructed.

Wallace, under the name of Ramsheg, was formerly visited annually by many more vessels than at present, the supply of lumber being then much greater; at present only a few cargoes are embarked, and two or three vessels built there every year. But, in proportion as the timber trade decreases, more attention is paid to agriculture, which is said to be improving, and the settlements increasing in the neighbourhood. There are no fisheries of consequence in a commercial point of view, the salmon and gaspereaux, or alewives, still visit the river, but in diminished numbers, and a few cod-fish are caught off Oak island and the neighbouring coast in the months of May and June. There is the same difficulty in obtaining a large supply of fresh water at Wallace as at Pugwash; it is obtained from wells and springs, which boats can only approach at high water.

SHIP CHANNEL.—Oak island bar is of sand, and extends from Oak island nearly 2¼ miles to the southward towards Gravois point, which may be recognized by its being the highest part of the clay and sandstone cliffs, and by its bearing and distance from the east end of Oak island, namely, S. ½ E. 3 miles. Within or to the westward of the bar the whole bay is shallow, excepting the Ship or Wallace channel leading to Wallace harbour. The outer or eastern side of this bar may be safely approached by the lead to the depth of 4 fathoms.

The Ship channel is fully 3 cables wide at its entrance, between the south point of the bar and the shoal which stretches out 4 cables from Gravois point, and has 3½ fathoms in it at low water. From the entrance the channel runs to the northward and westward, curving round Horton shoal, and between it and the shallow water to the northward, which is continuous from the bar to Mullin point, closing the entrance to Fox harbour, as already mentioned.

The Horton shoal, of sand, stretches out half a mile to the eastward from Horton and Cantwell points; and its northern part, drying out to the distance of 4 cables from the Horton spit, can therefore generally be seen.

The Horton spit, of low sand, enclosing a marsh, extending to the north-east from Horton point, and distant 2¾ miles north-westward of Gravois point, will easily be recognized by a vessel entering the Ship channel.

The northern end of this spit is quite bold, the channel passing close to it, and thence W. by N. three-quarters of a mile, to the entrance of harbour.

DIRECTIONS.—Winds from S.W., round south, to E.N.E. are fair or leading winds into Wallace harbour. Approaching from the northward, pass Oak island at a distance of fully three-quarters of a mile, or in 5 fathoms water, to avoid the reef off its east point. Approaching from the eastward, Treen bluff (the cliffy point $2\frac{1}{2}$ miles to the eastward of Gravois point) must be passed at an equal distance, or depth, to avoid the Treen reef, which is of sandstone, and stretches out half a mile from the bluff to the 3-fathoms line of soundings; the north extremes of Saddle island and Cape John in one, bearing S.E. by E. $\frac{3}{4}$ E., lead to the northward of it in 4 fathoms. In either case, approach the shore about half a mile to the eastward of Gravois point, taking care not to bring the east end of Oak island to bear less to the westward than N. by W., until the south side of Saddle island is only one degree open to the northward of Treen bluff, bearing E. by S. $\frac{1}{4}$ S.

Steer now W. by N. $\frac{1}{4}$ N., taking all possible care to keep the island as nearly as possible one degree open,* but remembering, that the lead must be principally depended upon to guide the vessel along the edge of the shallow water off the mainland, in $3\frac{1}{4}$ or 3 fathoms at low water, or a corresponding depth at other times of tide, until Smith point (the eastern extreme of the mainland outside or to the northward of Oak island), appears through the middle of the opening in the trees of Oak island, and over the low and narrow neck which joins the south-western part to the rest of the island, bearing N. $\frac{3}{4}$ W. Then alter course to N.W. by N., and a run of half a mile will place the vessel within, or to the westward of the south point of the bar, in about 16 feet at low water.

Let the course be now immediately changed to North for another half mile, and when Palmer point opens out to the northward of the Horton spit, bearing W.N.W., steer N.W. $\frac{1}{4}$ W., and the water will soon deepen to 4 and 5 fathoms with mud bottom, affording tolerably safe anchorage under shelter of the bar, on which the sea breaks in heavy weather. But, if it

* This mark is given as only better than none, for it is not easy to keep the island so nearly one degree open as is required. If the island and bluff be brought to touch, the vessel will be ashore on Gravois reef, and if they be opened to the extent of two degrees only, she will be on the south point of the bar. The lead, therefore, must be the principal dependence. There are other marks, but they are neither of a permanent nature, nor such as can be certainly distinguished by strangers; such, for instance, is the only house at present (with a barn close to the north of it,) between Mullin and Palmer points, which in line with the north extreme of Horton spit, bearing N.W. $\frac{1}{4}$ W., will lead in past the south point of the bar. A buoy on the south point of the bar, and two large beacons on Palmer and Horton points, might be so placed as to render this channel comparatively safe and easy.

be wished to proceed to the harbour, let the N.W. ¼ W. course be continued for half a mile, and Caulfield point will open out to the northward of the Horton spit; and, immediately afterwards Smith point (before mentioned), will open out to the westward of the west extreme of the trees on Oak island, when the vessel must be kept gradually away to the westward, and towards Palmer point, so as to run along the northern edge of Horton shoal, which can generally be seen, until off the Horton spit at the distance of a cable, whence the course is W. by N. for three-quarters of a mile to the harbour's mouth.

In entering the harbour keep two-thirds of the way over towards the northern, or Palmer point, which is quite bold, to avoid the shoal water extending half a cable from Caulfield point. Anchor anywhere from 1 to 5 cables within the entrance, where the channel is 1½ cables wide, and carries from 3 to 6 fathoms, with mud bottom. On either side, flats of stiff red clay, dry at low water, extend to the shore, and render the landing difficult when the tide is out. At the distance of 6 cables within the entrance, a middle ground commences, and diminishes the breadth of the channel to half a cable. Nearly abreast the eastern end of this middle ground, there is a narrow channel through the flats and up Lazy bay, which runs in more than a mile to the south-east, and has, on the southern shore near its head, cliffs of gypsum 30 feet high.

TIDES.—It is high water, full and change, at Wallace, at 10h. 30m.; and ordinary springs rise 8 feet, and neaps 5 feet. The rate of the tidal streams is greatest in the entrance of the harbour, and there it does not exceed 1½ knots during the summer months; whilst outside, in the Ship channel, it is usually from 1¼ to 1 knot. The ebb, however, may be somewhat stronger in spring after the melting of the winter's snows.

SADDLE ISLAND and REEF.—Saddle island is low, wooded, three-quarters of a mile long in an E. by S. ½ S. direction, and joined to the shore, from which it is distant in one part only about 1¼ cables, by shoals at low water. Its eastern point bears S.E. by E., and is distant a long 6 miles from Oak island.

Saddle reef runs out from the east point of the island one mile to the depth of 3 fathoms, and is very dangerous, having on it a round-backed rock called the Wash-ball, dry at low water, and distant one-third of a mile from the island. There are only a few feet of water much farther out. In approaching this reef from the northward, the soundings give little warning, but an excellent leading mark, namely, Treen bluff just open to the northward of Saddle island, and bearing W. ¼ N. just clears it in 4 fathoms. The lead affords the only guide for clearing it to the eastward, where it may be safely approached to the depth of 6 fathoms with care.

TATAMAGOUCHE BAY.—Mullegash point, the north point of Tatamagouche bay, is one mile to the southward of Saddle island; shallow water extends from the one to the other, and off the point to the distance of a long half mile.*

Tatamagouche bay, $2\frac{1}{4}$ miles wide at entrance, between the above point and Brulè peninsula, runs in 7 miles to the westward, affording everywhere good anchorage over a bottom of soft mud, but with insufficient depth of water for large ships far up the bay. From 5 fathoms at entrance the depth decreases to 3 fathoms at the distance of $1\frac{1}{2}$ miles up the bay, and to 2 fathoms at 4 miles, the remainder being all shallow, and in part dry at low water, with the exception of boat channels leading to the Basin and to Millbrook. The only detached danger in the bay is a rock with 7 feet least water, lying $3\frac{1}{2}$ cables off the northern shore, and 2 miles in from Mullegash point; Amet isle and Mullegash point touching, and bearing E.N.E. will lead a cable to the southward of it. A stranger may safely approach to the low-water depth of 3 fathoms in the outer part of the bay, and to $2\frac{1}{2}$ fathoms farther in; but in entering should keep well over to the northward, to avoid the Brulè shoals.

TATAMAGOUCHE RIVER, in the south-west corner of Tatamagouche bay, and 5 miles from its entrance, is approached by a very narrow channel through the flats, obstructed by oyster beds, and only one foot deep at low water, in ordinary spring tides; nevertheless new ships of considerable burthen are brought down it occasionally. The principal settlement in the bay, containing Mr. Campbell's ship-building establishment, and a chapel, stands on the western bank, and there is a bridge 2 miles up from the entrance of the river.

Several vessels visit this river for lumber every year; they anchor off it where there are only 11 or 12 feet at low water, and are suffered to ground on the soft mud as the tide falls without injury. There are excellent trout in the river, and also in Millbrook in the north-west corner of the bay, and the gaspereaux visit them in their season.

BARACHOIS HARBOUR.—Three miles to the eastward of the Tatamagouche river, on the same side of the bay, and between Chambers and Peninsula points, is the entrance to a small harbour called the Barachois, which runs in, within Chamber point, S.W. $1\frac{1}{2}$ miles, and is then contracted to a very narrow channel turning to the south-east into a shallow lake one mile long, with steep banks, and an island at its head. This place, which is seldom visited by shipping, has 12 feet over its bar, and 14 feet within at low water.

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* *See* Plan of Tatmagouche Bay and River John, No. 1,992; scale, $m = 2$ inches.

BRULE PENINSULA and SHOALS.—Brulè peninsula is wooded, rather low, and united to the mainland at its south-west end by a low and marshy isthmus. Peninsula point, its north-west extreme, has a reef extending from it 4 cables to the N.W., in great part dry at low water, and so bold that there is little warning by the lead. Brulè point is $1\frac{1}{2}$ miles farther to the eastward, the intermediate northern shore of the peninsula being nearly straight, and of clay cliffs 8 or 10 feet high, the whole appearing to a vessel in the offing like a low island in the centre of Amet sound.

The Brulè shoals, extending $1\frac{1}{3}$ miles to the north from Brulè point, are rocky with irregular soundings, and there is only 9 feet water not far from their outer edge. The north and north-west sides of these shoals should be approached very cautiously, for they are there extremely steep, having 4 or 5 fathoms close to the edge, and no good clearing mark. The English church steeple at the river John just open to the northward of Long point, bearing S.E. $\frac{1}{2}$ E., leads along their north-east side in 3 fathoms; their east and south-east sides may safely be approached by the lead to $3\frac{1}{2}$ fathoms.

BRULE HARBOUR runs in within Brulè peninsula, $2\frac{1}{4}$ miles, in a W.S.W. direction, and is nearly a mile wide, but the far greater part of this large space is occupied by flats of mud and weeds. There are 14 feet on the bar at low water, and 19 feet for a short distance within, but the channel soon becomes very narrow and divided into several branches.

The anchorage outside the bar, in $3\frac{1}{4}$ fathoms, mud bottom, is the best sheltered of any in the Sound, and a ship or two usually lie there to take in lumber every year. In the best berth Brulè point will bear N.W. by N. with the eastern end of Saddle island showing open one point to the right of it; Conn's large white house * S.W.; and Cape John N.E.

JOHN BAY and RIVER.—John bay, the next bight to the eastward of Brulè harbour, runs in nearly 4 miles to the south-east from Cape John to Murphy point, which is the sandy east point of entrance of the river. The bay is free from detached dangers, but the shoals extending out from its shores are often very steep, and should not be approached nearer than the low water depth of $3\frac{1}{2}$ fathoms, nor without due caution. Sandy shoals occupy the head of the bay, drying out nearly half a mile, and extending $1\frac{1}{4}$ miles from the entrance of the river to the 3-fathoms line.

Cape John, the northern point of John bay, will be easily recognized by its sharp pointed cliffs of sandstone 40 or 50 feet high; and by two high

* Conn's house stands a short distance back from the southern shore of the harbour, and about 50 feet above the sea; it is at present the only two story house in that place, and has a large barn close to east of it. It bears S. by W. $1\frac{1}{3}$ miles from Brulè point.

rocks, always above water, on the inner part of the reef which extends from it 4 cables to the N.W. This reef is very steep, especially at its western point, where there are nearly 7 fathoms at low water quite close to it, being a greater depth than occurs anywhere else near. Off the northern side of the cape, shallow water extends nearly half a mile, and as there are only 15 or 16 feet close within the 3 fathoms mark, large vessels should not approach nearer than the low water depth of 4 or $3\frac{1}{2}$ fathoms.

The river John has only one foot at low water over its bar of sand, and an irregular depth, from 3 to 11 feet, in a very narrow channel up to the bridge, a distance of nearly a mile. At Rogers point, $1\frac{1}{3}$ miles higher up, the river is fordable at low water; and there are deep holes and fords for 5 miles farther to where the tide ends. Several new ships are built here annually, and notwithstanding the shallow bar, are taken out light and moored outside to take in cargoes of lumber which are brought down the river. The vessels lie off the entrance in from $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms, over mud bottom; and although the bay is completely open to the north-west are considered safe in the summer months.

There are extensive and flourishing settlements on either side of this river. The English church will be known by its spire, about a quarter of a mile to the eastward of the bridge; and the chapel by its cupola, on the opposite or western bank, one-third of a mile from the bridge towards the river's mouth. The saw mills, at $3\frac{1}{2}$ miles above Rogers point, are said to have greatly diminished the numbers of salmon and gaspereaux which visit this stream.

AMET SOUND is very extensive, affording excellent anchorage for any number and class of vessels. The places just described are all within this sound; Tatamagouche bay being its south-west, and John bay its eastern arm. Mullegash point and Cape John, its western and eastern points of entrance, are more than 4 miles apart, but there are detached dangers outside, or off the entrance, which require to be described before directions can be given for entering by either of the three channels which they form.

WAUGH SHOAL, which from its position and steepness is extremely dangerous, is a rocky bank, nearly $1\frac{1}{4}$ miles long and half a mile broad, with irregular soundings from $3\frac{1}{2}$ to 5 fathoms, excepting towards its northern end, where there is a patch of considerable extent with from 2 to $2\frac{3}{4}$ fathoms: 12 feet being the least water, unless it may be in unusually low tides. In this shallowest part, the shoal is very steep and should not be approached from the northward nearer than the depth of 7 fathoms, but in all other parts vessels may approach to 5 fathoms at low water. There are no clearing marks for the western side of this shoal, the lead and the

bearing of the east end of Saddle island S.W. ½ S. are there the only guides. The north-east side is just cleared in 5 and 6 fathoms, either by the eastern extremes of Amet islet and Cape John in one, bearing S.E. ¼ S., or by the western side of Cape John and the English church steeple at the river John in line, bearing S.S.E. ½ E. The south-east side is cleared in 4 fathoms, by the eastern extremes of Mullegash and Chambers points in one, bearing S.W. ½ S. All these objects will easily be made out excepting Chambers point, which, being very low, is at times difficult to distinguish from the high land behind it.

AMET ISLE and SHOALS. — Amet islet is very small, covering a space of 460 yards east and west, with an extreme breadth of 80 yards. It is divided into two parts, of which the western is the largest, presenting clay cliffs on every side, excepting where they are joined together by a sandy neck. It is flat at top, bare of trees, covered with a coarse grass, and about 20 feet above the sea at high water.

This islet was formerly much larger than at present, and the cliffs still continue to be undermined by every heavy gale and high tide; the frosts also aid in the work of destruction, so that the time cannot be very distant when there will only remain a reef of the highly inclined sandstone which at present forms the base of the islet, and dries out to the distance of about 2 cables, excepting on the southern side, where boats can generally land at all times of tide. Shallow water extends off the islet 3 cables to the westward, and will be cleared in not less than 2¼ fathoms, if the English church steeple at the river John be not shut in behind the western side of Cape John; but vessels of large draught should stand in only to 6 fathoms, remembering that in every other direction shallow water extends from the island to far greater distances.

The Amet shoals are rocky with very irregular soundings, and are much more extensive and dangerous than have been hitherto represented. They extend nearly 4 miles from the islet to the eastward, and also to the south-east 2 miles towards Cape John. In both directions there are rocky patches, with no more than 5 or 6 feet water, a long mile out from the islet; at a greater distance than 2 miles there are not less than 16 feet, but there is a patch with that depth fully 3 miles to the eastward of the islet. The marks for this East patch are, the north extremes of Amet island and Treen bluff in line, bearing W. ¼ N., and Cape John S.W. ½ S. Conn's house (page 66) and Cape John bearing S.W. lead about a quarter of a mile to the south-east of it in 4 fathoms water; but to clear the extreme east end of the shoal in a greater depth, Cape John must bear to the westward of S.W. by W. The northern side of these shoals is very steep, and should not be approached in a large ship, especially at night,

to a less depth than 10 fathoms. Treen bluff and Saddle island touching, and bearing W. by N. lead along the southern side in $2\frac{3}{4}$ fathoms, but if kept distinctly open will clear it in $3\frac{1}{4}$ fathoms.

DIRECTIONS through WESTERN PASSAGE.—The dangers just described form three passages into Amet sound, all of which are wide and deep enough for vessels of the largest draught. The Western passage, between Saddle island and reef and the Waugh shoal, is a mile wide, with irregular soundings from 5 to $8\frac{1}{2}$ fathoms, the lesser depth being to the southward of Waugh shoal, where the bottom is rocky and uneven, whilst farther westward it is of mud. The description of the dangers already given, with the bearings and leading marks for avoiding them, will enable any vessel furnished with the Admiralty chart to safely run through this wide and clear passage with a fair wind, taking care to avoid the east end of Saddle reef, when hauling round it to the southward; 6 fathoms water is near enough until Treen bluff is seen through between Saddle island and the main, after which Mullegash point may be rounded by the lead in any convenient depth. The anchorage is everywhere good in Tatamagouche bay, regard being had to the size of the vessel and consequent depth required; but over towards the Mullegash side will be found best sheltered from north-east winds.

If bound to Brulè harbour, after rounding Saddle reef, steer for Brulè point, or a little to the east of it, until the mark for clearing the north-east side of the Brulè shoals, namely, the English church steeple in the John river a little open to the northward of Long point comes on; then alter course, and run towards those marks till Brulè point bears S.W. by W., when haul in S. by W. or S.S.W., and run by the lead along the south-east side of the Brulè shoals, in from $3\frac{1}{4}$ to $3\frac{1}{2}$ fathoms, until the position is reached which has been pointed out (page 66) as the best anchorage outside the bar. A pilot, or a previous buoying of the channel, would be necessary to take the vessel into the harbour.

If bound to the anchorage off the bar of the river John, it is only necessary to run up the middle of John bay till the water shoals to $3\frac{1}{2}$ fathoms, which is as near as a large ship should go, although distant $1\frac{1}{2}$ miles from the river's mouth. Vessels of less but of considerable burthen lie moored in $2\frac{1}{2}$ fathoms half a mile farther in, for the convenience of taking in lumber.

In beating through the Western passage, the west end of Saddle island may be approached to the depth of 5 fathoms, but 7 fathoms is near enough to its eastern end. In the board towards Saddle reef, take care to tack with Treen bluff open to the northward of Saddle island; and in the board to the northward, towards Waugh shoal, in 5 fathoms. When

standing towards Amet islet, let the leading marks for clearing the shallow water off it to the N.W. and S.W. (page 68) be attended to. Within Amet sound, the directions and remarks already given, together with the Admiralty chart, will afford sufficient guidance.

Through MIDDLE PASSAGE.—The Middle passage into Amet sound, between the Waugh shoal and Amet islet, is a long mile wide from the depth of 5 fathoms to 5 fathoms on either side, clear of all danger, and carries 6 to 10 fathoms water, with sand and mud bottom. An excellent leading mark for running through this passage with a fair wind, is Conn's house (page 66) and Brulè point in line, bearing S. by W.

With beating winds, the leading marks and directions already given for clearing Waugh shoal and Amet islet will divest this passage of all difficulty or danger.

Through EASTERN PASSAGE.—The Eastern passage into the sound, between the Amet shoals and Cape John, is a long three-quarters of a mile wide, from 3 fathoms to 3 fathoms water on either side, with irregular soundings from $3\frac{1}{2}$ to 6 fathoms, and with rock, red sand, broken shells, and mud bottom.

It is difficult to carry more than 4 fathoms through at low water. To safely take this passage from the eastward with a fair wind, bring Cape John to bear to the westward of S.W. by W., or bring that cape and Brulè point to touch, bearing S.W. by W. $\frac{1}{2}$ W., and steer for them till Treen bluff opens to the southward of Saddle island, when alter course to W. $\frac{1}{2}$ S., which is for the mouth of Tatamagouche bay, and the vessel will sail nearly through the middle of the passage. There will be no danger from the Amet shoals, if Treen bluff be kept open to the southward of Saddle island; nor yet from the shallow water off Cape John, if it be not approached nearer than the depth of 4 fathoms, or at the utmost $3\frac{1}{2}$ fathoms.

These last remarks apply also to the case of a vessel beating through this passage; and in taking it from the northward, with a scant easterly wind, the clearing marks from the east end of the Amet shoals will safely guide her.

TIDES.—In Amet sound it is high water, full and change, at about 10h.; and ordinary springs rise 8 feet, and neaps 5 feet. The tidal streams are very weak within the sound, setting regularly up the bays and rivers. In the Western passage both tides in general set fairly through, the flood about W. by N., and the ebb about E. by S., at rates never exceeding $1\frac{1}{2}$ knots, and usually much less. In the Middle passage the ebb sets out to the northward and eastward less than a knot; and the flood to the westward, at the same rate, over Waugh shoal. In the Eastern passage the

ebb sets out to the E.N.E. and the flood in the opposite direction, the rates varying from a half to one and a half knots.

The COAST from Cape John trends S.E. by E. $\frac{1}{2}$ E. 15 miles to the West Gully of Caribou, and is nearly straight, unbroken, and free from danger, the shoal water nowhere extending beyond one-third of a mile off-shore. Cliffs of clay and sandstone, not exceeding the height of 50 feet, and in general much lower, form the predominating feature ; but there is, nevertheless, good landing for boats almost everywhere in fine weather. From the West Gully to Caribou point, $4\frac{1}{4}$ miles farther to E.S.E., the coast is formed by the northern shore of Caribou island, appearing from a distance like several islands ; but on a nearer approach the wooded parts are found to be joined together by sand-bars. The shallow water extends off-shore here to the distance of half a mile, and the depth of 5 fathoms is near enough in a large ship.

CARIBOU and DOCTOR REEFS.—Caribou reef, of large stones, which dry out to the distance of 3 cables from the shore, is very dangerous, the deep water approaching nearly close to its north point and eastern side. It stretches out from Caribou point to the N.N.E., half a mile to the 3 fathoms and two-thirds of a mile to the 5 fathoms line of soundings. Doctor island lies to the southward of Caribou point, forming two entrances into Caribou harbour, of which the northern, between two sandy spits, is 4 cables wide, but has only 4 feet in it at low water.

Doctor reef, also very dangerous, extends from Doctor point to the eastward $1\frac{1}{4}$ miles, to the depth of 3 fathoms, and shows rocks dry at low water to the distance of half a mile. To the southward of this reef, and two-thirds of a mile S.E. from Doctor point, lie the Seal rocks, dry at low tide, and from which the shallow water, forming the bar of Caribou harbour, extends to Logan point, the north point of Pictou bay.*

CARIBOU HARBOUR, between Caribou and Doctor islands and the mainland, is an extensive place, being 6 miles long from the southern entrance to the West Gully, and in some parts a mile wide. The whole of this large space is occupied by shallow water, excepting the narrow channel of the harbour, which is deep enough for vessels of far larger draught than can pass the bar, but does not run through, being lost in mud flats at the distance of $3\frac{1}{2}$ miles from the southern entrance. The West Gully is dry at low water; about a mile within it Caribou river enters the harbour, and is navigable for boats to the distance of 2 or 3 miles. There are settlements and farms along the southern shore of the harbour, also upon the inner side of the islands, and a road from the former to Pictou.

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* *See* Plan of Caribou Harbour, No. 1,977 ; scale, m = 3 inches.

The ship entrance to this harbour, between Doctor spit and Widow point, is only 120 yards wide, and the navigable breadth is reduced by the shallow water off Widow point to 80 yards. The depth is here 5 fathoms; but an abrupt turn, and a tide of 4 knots, render so narrow a channel extremely difficult. Outside the entrance, the channel between the shoals becomes wider, and the depth diminishes gradually out to the bar at the distance of a mile, and over which only 9 feet can be carried at low water. The great superiority of the neighbouring harbour of Pictou renders it in the highest degree unlikely that ever this harbour will be much frequented by shipping; and its bar and entrance are too difficult and dangerous to be attempted without some special object, and then a pilot should be employed. Nevertheless, the following directions may be useful in illustration of the Admiralty chart, merely noticing that Widow point, the south or mainland point of entrance of the harbour, is of sand and shingle; and that Oak-tree point, a steep clay bank, with a house and barn upon it, is the first point of the mainland within the entrance, from which it is distant half a mile.

DIRECTIONS.—To enter Caribou harbour,—having a fair wind, and being in not less than 5 fathoms water,—bring the high-water extremes of Widow and Oak-tree points in one, bearing W.N.W., and run towards them, till the vessel has passed the bar in the low-water depth of 9 feet, and has deepened to 13 or 14 feet. Then look out when Caribou and Doctor points come in one, bearing N. by W. $\frac{1}{4}$ W., when sheer immediately to the northward, sufficiently to bring Oak-tree point and Doctor spit in one, bearing W. by N. $\frac{1}{2}$ N. Keep the last named marks accurately in one, or closely touching, until the vessel is not more than 60 yards from the end of the spit, when sheer to the south-west so as to pass its south extreme at the same distance into the harbour. The channel, for the first half mile in from the entrance, is not more than 180 yards wide, the tide is stronger there, and the bottom not quite so good as farther in, where the channel expands to 260 yards in width, with a depth of from 4 to 7 fathoms over mud bottom.

TIDES.—At Caribou it is high water, full and change, at about 10h.; the diurnal inequality causing at times a difference of nearly 2 hours in the two tides of the same day, and also several feet in the height of the water. The rise of the highest of the two ordinary spring tides of the same day is 6 feet, and of neap tides 4 feet; there are therefore 15 feet over the bar at high water ordinary springs.

CARIBOU CHANNEL, between the Caribou reef and the Pictou Island bank, has sufficient depth for vessels of the largest draught, and in

breadth, at the narrowest part, exceeds a half or one-third of a mile, according as it is conceived to be bounded on either side by the 3 fathoms, or the 5 fathoms line; but it is nevertheless difficult, because so crooked that no marks can lead through its whole extent.

The safest mode of running through this channel to the westward, is to strike soundings in 6 or 7 fathoms on the edge of the shoal water off Doctor island, and follow it to the north-west until Mackenzie head is just shut in behind Logan point, bearing S. $\frac{1}{2}$ W. Then steer from those marks, keeping the head just shut in, and they will lead across the deep water, and afterwards along the western edge of the Pictou Island bank out to sea. If the wind were strong from the south-west with an ebb tide, it would be preferable to keep on the weather side of the channel, in which case the edge of the shoal water off Doctor island should be followed farther to the north-west, until Logan point is only a little open to the eastward of Doctor point, bearing South. Those points in one lead along the east side of Caribou reef at the distance of a cable, and in 4 fathoms water. Keep Logan point a little open, and it will lead clear out to sea in not less than $4\frac{1}{2}$ fathoms.

The same marks and directions, taken in reverse order, will enable a vessel to take this channel from the northward or westward, it being only necessary to add, that she should not haul to the eastward until the Hawksbill is well shut in behind Caribou point, nor open out the former again after having shut it in, until the lighthouse at Pictou is open to the southward of Cole point; the lighthouse and Cole point in line, bearing W.S.W., being the mark for clearing the south extreme of the Pictou Island bank in 5 fathoms.

PICTOU ISLAND BANK extends from Pictou island to the west and south $3\frac{1}{4}$ miles, and was supposed to reach across the whole distance of 4 miles to Caribou point, before the channel last described was known. It is of irregular outline, of great extent, and of sandstone thinly covered with sand, gravel, mud, and broken shells. The depths are as irregular as the nature of the bottom, being from $2\frac{3}{4}$ to 6 fathoms, excepting on the Middle shoals.

The Middle shoals are a chain of rocky patches, with 11 feet least water stretching across the northern part of the bank, $1\frac{1}{4}$ miles, in a W. by S. direction; so as to approach within half a mile of the Caribou channel on the one hand, and within $1\frac{1}{4}$ miles of the west point of Pictou island on the other. There is but little doubt that at least $3\frac{1}{4}$ fathoms at low water can be carried through between these shoals and Pictou island, although the irregular soundings forbid absolute certainty. Roger point and West point (Pictou island), bearing E.S.E., will lead to the northward of them in 4 fathoms, but large ships had better not approach them on that side nearer than 7 fathoms.

PICTOU ISLAND, $4\frac{1}{4}$ miles long east and west, and $1\frac{1}{4}$ miles wide, is of clay and sandstone, rising in the central parts to the extreme height of 150 feet above the sea. It is wooded on the northern side, but there are settlements and farms along its southern shore. Low cliffs form its outline with the exception of several small bays, and Rogers point, on the south side, which is of sand, and affords the best landing for boats.

West point may be passed in 3 fathoms water within half a mile; but on either side of the west end of the island there are rocks, nearly dry at low water, just within the 3 fathoms line and extending to the distance of 3 cables off shore. The shallow water runs out occasionally to the same distance off the north shore of the island, which should not be approached nearer than the depth of 8 or 9 fathoms in the night-time. The southern shore may be approached to 5 fathoms; but off East point a dangerous reef, in great part dry at low water, runs out half a mile to 3 fathoms, and nearly a mile to the 5 fathoms line. There are 9 fathoms not far off this reef both to the northward and eastward; it should therefore be approached with caution at all times, but especially at night, and with a flood tide. In most of the old charts a shoal is laid down about 4 miles to the eastward of Pictou island, but not any indications of its existence were discovered.

LIGHTS.—The lighthouse, standing close to the water at the extremity of the spit forming the south side of the entrance to Pictou harbour, is an octagon building of wood, 55 feet high, and painted vertically with red and white stripes. It shows, at an elevation of 65 feet above the level of high water, a *fixed white* light, which is visible in clear weather at 12 miles. A small *fixed red* light is seen below the lantern.

The lighthouse, on the East point of Pictou island, is a square wooden tower, painted white. It exhibits, at 52 feet above high water, a *fixed white* light, visible in clear weather from a distance of 12 miles.

PICTOU HARBOUR, in every respect the finest on the southern shore of the Gulf eastward of Gaspè, derives additional importance from the coal mines, valuable quarries of building stone, and finely settled country in its neighbourhood. It is situated 5 miles to the southward of Caribou point, and at the bottom of a bay, which is $1\frac{3}{4}$ miles wide at its entrance, from Logan point to Mackenzie head, and $1\frac{1}{2}$ miles deep. Mackenzie head will be recognized by its sharp pointed cliff of clay and sandstone 40 feet high, and by its bearing nearly South from Logan point.*

The town of Pictou stands on the north shore of the harbour, 2 miles within the lighthouse. The houses are crowded together along the shore of a small bay, and on the declivity of a ridge, which rises to the height of 200 feet above the sea, at a short distance in rear of the town. A spur

* *See* Plan of Pictou Harbour with View, No. 1,989; scale, $m = 3$ inches.

from this ridge forms Battery point, which shelters the place from the east winds, and hides all but the steeples of its three churches from vessels entering the harbour. There are also several other places of worship and an academy. These buildings are all of wood, but many of the dwelling-houses are of stone. The population, in 1843, was estimated at 2,000. In 1856 the total value of imports amounted to 58,662*l.*, of exports 71,499*l.*

Opposite the town the harbour expands into three large arms, at the heads of which are the East, Middle, and West rivers. The channels of the two last are seldom used, excepting by boats or very small craft; unless it be to bring down newly built vessels, when they are staked for the purpose. They may be navigated without much difficulty for 2 or 3 miles above their confluence; but higher up they become divided into several narrow channels, often obstructed by oyster beds, and winding through extensive flats of mud and weeds, which render landing difficult when the tide is out.

The shores of the West arm are well settled all the way to the head of the tide, 5 miles from Pictou; and the post road to Truro and Halifax passes along the northern shore, where the scenery and views possess much beauty. Several of the hills to the westward of this arm are of considerable height; Rogers hill, 5 miles from Pictou, is 546 feet; and Dalhousie mountain, 3 miles farther south-west, the highest point of which is 950 feet above the sea at high water. There is a road up to the summit of the former from which the view is magnificent. West river, above the tide water, is a considerable stream, although shallow and rapid. It winds its way through a beautiful and well cultivated valley, containing a large population.

The Middle arm runs in $5\frac{1}{2}$ miles from Pictou to the south-west, at which distance the tide ends, and the river is rapid and fordable at low water. The shores of this arm are as yet thinly settled.

The East arm is navigable by vessels to the distance of $2\frac{1}{2}$ miles from Pictou, to the coal-loading place, or railway terminus from the Albion mines. Its channel, which joins the harbour directly opposite Pictou, is of the average breadth of 180 yards, and marked out by spruce-bush stakes driven into the mud flats at intervals on either side. Half a mile below the loading place a bar of hard ground, with 12 feet at low water, crosses the channel; and therefore vessels must not be laden to draw more than 15 feet in neap and 18 feet in spring tides. At a short distance above the loading place the channel is so divided and obstructed by old oyster beds, that it is difficult to carry the depth of 3 or 4 feet through at low water; and similar obstructions occur several times up to the bridge at New Glasgow, $6\frac{1}{2}$ miles from Pictou.

New Glasgow is a considerable village on the east side of the river, owing its existence to the coal mines, which are about 2 miles higher up, and to which boats can ascend with the tide. New vessels of considerable burthen are built at the village, and are taken down the river when light with the assistance of the tide.

Water.—Sufficient water may be obtained here to supply the largest ships. The best watering place is on the south shore of Pictou harbour, three-quarters of a mile within its mouth; and there is another opposite the coal-loading place in the East river.

PILOTS.—The branch pilots of Pictou are for the most part able and experienced men, and are always on the look out for vessels.

MACKENZIE SHOAL lies N. E. by E. from Mackenzie head, its outer edge being distant seven-eighths of a mile. It is a rocky bank nearly one-third of a mile in diameter, with 16 feet least water, and with 19 or 20 feet between it and the shallow water to the westward. Vessels of large draught should not attempt to pass within or to the southward and westward of it. Caribou and Doctor points in one, bearing N. by W. $\frac{1}{2}$ W., will lead a cable to the eastward of the shoal; and the lighthouse in line with Town point at Pictou bearing West will lead 2 cables to the northward. (*See* View on Plan.)

The shallow water extends a long half mile to the northward from Mackenzie head, and its edge in 3 fathoms, trends thence to the westward towards the lighthouse, the whole bay on that side being shoal, with ridges of sand drying out to a considerable distance from the shore at low water. In the bay between Mackenzie head and the lighthouse, and on the west side of Powell point, is Boat harbour, the entrance of an extensive inlet or lake, full of mud and weeds, and which boats can traverse only when the tide is in. On the opposite or northern side, reefs extend off Logan point to the east and south-east, a long half mile to the 3 fathoms line of soundings. The lighthouse and Cole point in line, bearing W.S.W., lead over the south-eastern extreme of these reefs in 14 feet at low water, but vessels should not go nearer than the depth of 4 fathoms. Cole point, which is of clay and sandstone cliff 30 feet high, and lies a short mile farther in or to the south-west from Logan point, has also a reef stretching out to the S.E. one-third of a mile, and the shallow water continues from it westward to the commencement of Loudon beach on the north side of the entrance of the harbour.

PICTOU BARS and PICTOU ROAD.—The distance across the harbour's mouth from the lighthouse on the sandy spit to Loudon beach is

about $2\frac{1}{4}$ cables, and the greatest depth is 7 fathoms water; but the channel over the Inner bar is much narrower, and has besides a turn in it, which, together with the necessity of knowing exactly the set of the tides, renders a pilot indispensable in a large ship. Vessels running for the harbour must first pass the Outer bar, which stretches from Logan point to Mackenzie head, and has 21 feet at low water over a bottom of sand. After passing this bar, the depth will increase to 4, 5, and 6 fathoms in the distance of about a mile, and then suddenly decrease to 19 feet on the Inner bar, which is also of sand, and distant about 4 cables from the lighthouse. After passing the Inner bar, which is not above a long cable wide, the water continues deep to the entrance of the harbour.

There is good anchorage between the bars, although exposed to north-east winds, and also in Pictou road, which is outside the Outer bar, and where the depth is 5 fathoms, with clay and mud bottom. Vessels running or beating up to this road at night will find the soundings in the chart sufficient guidance, when keeping the southern shore aboard with the prevailing south-west winds; and on the opposite side or with northerly winds will have the advantage of the following excellent leading marks. The light in Pictou harbour can be seen in a clear night from a distance of about 12 miles, and when in one with Cole point bearing W.S.W. leads a long half mile to the eastward of the reef off the east end of Pictou island; and also clears the southern extremity of the Pictou Island bank in $5\frac{1}{4}$ fathoms: therefore, if beating, tack in the board to the northward, the instant the light begins to disappear behind Cole point; and if running keep the light just open to the southward of Cole point, bearing W.S.W. until soundings are struck in the low-water depth at 5 fathoms, on the edge of the bank off Logan point; then follow the same depth about $1\frac{1}{2}$ miles to the south-west, taking care not to bring the light to bear to the northward of West, and the vessel will be in safe anchorage in the road, where she may wait for daylight, or a pilot, according to circumstances. Although 19 feet at low water, in ordinary spring tides, can be carried over the Inner bar, yet the aid either of buoys, or of an able and experienced pilot would be required to insure that depth; but 17 feet may be safely reckoned upon, if the following brief directions are strictly followed; and the greater depth will be carried in, if the endeavour to follow them exactly has been successful.

DIRECTIONS.—Having a fair wind, and being farther out than Mackenzie shoal, the position of which has been pointed out, bring the lighthouse in line with Town point at Pictou, bearing a degree or two to the southward of West;* or, which will be the same thing, with Smith point, the

* *See* View on Plan.

extreme of the land on the same side beyond the town. Run with those marks on until Logan and Cole points come in one, bearing N.E., when instantly sheer a little to the northward, sufficiently to bring Town point in one with the north extreme of the Sandy spit. Keep the last-named marks exactly in one, until the Roaring Bull comes in one with Mackenzie head, bearing S.E. by E. $\frac{1}{4}$ E., when change the course smartly and run from those marks, keeping the Roaring Bull only just in sight, until the north extreme of Moodie point (the first point on the south side within the lighthouse) opens out to the northward of the Sandy spit : then haul to the westward, at first towards the south-west extreme of Loudon beach, and afterwards so as to pass midway between it and the Sandy spit into the harbour.

A pilot would be indispensable in a vessel of large draught with beating winds, and even smaller vessels must know the tides and the place well to beat in or out with safety.

From the lighthouse to the usual anchorage, in 6 or 7 fathoms, mud bottom, off the easternmost wharves at Pictou, the channel of the harbour is direct, nearly one-third of a mile wide, deep enough for the largest ships, and clear of danger ; the Admiralty chart will therefore afford all farther information that may be necessary ; for the vessel will be in safety, and may anchor anywhere within the lighthouse.

TIDES.—It is high water, full and change, at the entrance of Pictou harbour at 10h. ; and the rise is 6 feet in ordinary springs, and 4 feet in neaps. With a good tide it is possible to carry 25 feet over the bar, and 23 feet may generally be reckoned upon ; the harbour, therefore, is capable of admitting vessels of large draught, but it must be remembered, that the best of the two tides is always spoken of in the 24 hours, for the diurnal inequality, in the rise of the tides, which occurs more or less in all parts of Northumberland Strait, is very strongly marked in this harbour. It may also be added, that in the month of August, when these observations were made, the a.m. tides were always the highest, following the inferior transit of the moon with north declination in the first part of the lunation, and the superior transit with south declination in the latter part. The true establishment, as nearly could be deduced from the observations of one complete semi-lunation, was at 9h. 45m. mean time.

At New Glasgow bridge it is high water, full and change, at 12h. ; and the rise is 6 feet in springs and $3\frac{1}{2}$ feet in neaps.

The ROARING BULL, noticed above, and distant 4 miles to the eastward of the lighthouse in Pictou harbour, is the cliffy north point of a small peninsula, united to the mainland at its western end by a sandy beach, and having at the other extremity the gully or entrance to Chance

harbour, dry, or nearly so, at low water. A reef of sandstone runs out to the north-east from the Roaring Bull, 3 cables to the 3 fathoms line of soundings.

LITTLE HARBOUR.—In the shoal bay between Evans and Colquhoun points, which are distant 5 and 6½ miles respectively from the lighthouse in Pictou harbour, are two narrow, dangerous, and intricate channels, leading through shoals into Little harbour. Of these channels the eastern and best turns sharp in to the eastward, within Roy island, and close round the sandy spit at its south-west extreme. The other has only a foot or two water, and leads into the western part of the harbour, which is several miles in extent, and broken into bays, coves, and picturesque points, but only fit for boats, being nearly all dry at low water, excepting the intricate and narrow channels.*

Roy ledge, a small rocky shoal, with 9 feet least water, lies off the north shore of Roy island, at the distance of 3½ cables, and three-quarters of a mile N.W. ½ W. from Colquhoun point. There is also a reef of sandstone, in great part dry at low water, running out from Colquhoun point half a mile to the eastward ; and as all these dangers have 5 fathoms water close to them, vessels should be careful not to stand into less than 6 fathoms along this part of the coast.

Roy island is united at its east end to the mainland by a long and narrow sand-bar, stretching to the south-east across the east end of Little harbour, to within three-quarters of a mile of King head, which is the west point of entrance to Merigomish harbour.

MERIGOMISH HARBOUR has 14 feet at low water over its bar, and and sufficient depth within for vessels of large draught ; but it is so intricate and difficult of entrance that no directions would enable a stranger to take his ship in safely ; and the northerly winds send in so heavy a sea over the bar, that to get on shore going in would probably be attended with the loss of the vessel. The outer entrance of the harbour (three-quarters of a mile wide) is between King head and Merigomish point, the latter being the west extreme of Merigomish island. The bar is formed by rocky shoals running out from these points of entrance, three-quarters of a mile to the northward. The channel over the bar, and leading in from it between the shoals, is a long cable wide ; but the shoals are so steep that the lead affords little guidance, and there are no leading marks. The course running in is at first to the southward, and then by a sharp turn to the eastward close past Savage point (the sandy

* *See* Plan of Merigomish Harbour, No. 1,990 ; scale, *m* = 3 inches.

spit at the south-west extreme of Merigomish island) into the harbour. This inner entrance of the harbour, between Savage point and the east end of Olding island, is about a quarter of a mile wide ; but the navigable breadth is reduced to half a cable by the shoal off Olding island, and the tides frequently run there at the rate of 5 miles an hour.

Before the timber was exhausted, this harbour was frequented annually by shipping, which usually lay moored close to the sandy south-east point of Olding island ; but at present it is seldom visited by anything larger than a coasting schooner. The pilots are therefore incompetent from want of practice, and the channel is no longer buoyed as it used to be formerly. The harbour is of great extent, running in 5 or 6 miles to the eastward, within Merigomish island, and the sand-bar which joins it to the mainland ; and also 4 miles to the westward, up a bay full of islands, coves, and precipitous headlands, which, together with well-cultivated fields, backed by mountains 800 or 900 feet high, form scenery of unusual beauty. Several small streams enter the harbour, of which French river, opposite the east end of Olding island, is the principal. It is approached by a very narrow channel, through flats of mud and weeds, and can be ascended by boats to the bridge, about a mile within its entrance.

Merigomish island, $3\frac{1}{4}$ miles long and $1\frac{1}{3}$ miles broad, is of clay and sandstone, belonging to the coal formation ; rising to the height of 150 feet above the sea. Thin seams of coal may be seen at Coal point, where the cliffs, which form the northern shore of the island, are 35 feet high. Its southern shore, where there are increasing settlements, is broken into coves, cliffy islets, and peninsulated points similarly to the western part of the harbour. A sand bar, $2\frac{1}{2}$ miles long, unites the island to the mainland to the eastward, excepting in unusually high tides, when the water washes over one part of it into the harbour.

TIDES.—At Betty point, in Merigomish harbour, it is high water, full and change, at 10h. 6m. ; and ordinary springs rise $5\frac{1}{4}$ feet, and neaps $3\frac{1}{4}$ feet ; but the diurnal inequality is strongly marked here, as well as at Pictou, causing a considerable difference in the times and the heights of the two tides on the same day.

The COAST from Merigomish harbour trends E. by N. 27 miles to Cape George (page 129), and is bold and free from danger. The land, rising from the sea to the summit of a ridge 2 or 3 miles in rear of and parallel to the coast line, is well settled, the cultivation extending occasionally to the summit of the ridge, which attains the extreme elevation of 1,100 feet above the sea.

There is no harbour in this distance, the wooden pier at the village of Arisaig affording shelter only to boats and shallops in easterly winds, but none in winds from between north and west.

The remarkable rock called the Barn lies nearly a mile to the eastward of this pier, and half a mile N.E. from Arisaig church, which last is 14 miles from the entrance of Merigomish.

Malignant cove, which has a small stream at its head, affording good landing for boats, is 3 miles farther to the eastward, and will be known by the Sugar Loaf hill, a mile in rear of it, and 680 feet high above the sea at high water.

CHAPTER XVII.

GULF OF ST. LAWRENCE; SOUTH-WEST COAST,—WEST AND SOUTH COASTS OF PRINCE EDWARD ISLAND, FROM NORTH POINT, TO WEST POINT, AND TO CAPE BEAR.

VARIATION $21\frac{3}{4}°$ to $22\frac{1}{2}°$ West in 1860.

PRINCE EDWARD ISLAND, separated from the south-western shore of the Gulf of St. Lawrence by Northumberland Strait, is 102 miles long, and in one part about 30 miles broad, but the breadth is rendered extremely irregular by large bays, inlets, and rivers, or rather sea creeks, which penetrate the island so that no part of it is distant more than 7 or 8 miles from navigable water. Its shape is an irregular crescent, concave towards the Gulf, the northern shore forming a great bay, 91 miles wide and 22 miles deep, out of which the set of the tides and the heavy sea render it very difficult to extricate a ship when caught in the north-east gales, which frequently occur towards the fall of the year, occasionally blowing with great strength and duration, and at such times proving fatal to many vessels.*

The island is based upon red sandstone, in which coal fossils have been found, but no coal; and cliffs of this rock and red clay prevail along its shores, excepting where long ranges of sand-hills and sand-bars have been thrown up by the sea on the north coast.

In the interior of the island, the most elevated ridges do not exceed 400 or at the utmost 500 feet above the sea, and the land is in general much lower, especially near the coast; the prevailing feature being undulating, and the alternation of hill and dale and inlet forming very pleasing scenery. The soil is in general fertile and easily worked; the climate less severe than in Lower Canada; not quite so cold in winter, nor so hot in summer, being tempered by the sea breezes; but on the other hand, the advance of spring is checked by northerly winds from the Gulf, driving down ice which sometimes fills the Strait as late as the middle of May, so that instead of the sudden outbreak of vegetable life which is observed in Canada, it is here frequently retarded till the month of June is well advanced, and there is seldom any settled warm weather much before July.

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* *See* Charts :—Gulf of St. Lawrence, Sheets 8 and 9, Eastern and Western parts of Northumberland Strait, Nos. 1,747, 2,034; scales, $m = 0{\cdot}25$ and $0{\cdot}28$ of an inch.

But the most important advantage of the climate to the seaman, is the rare occurrence of the dense fogs which so frequently embarrass him in other parts of the Gulf; and which in Northumberland Strait are seldom seen. It is worthy of remark that the prevailing south-west wind of summer, which in the Bay of Fundy is generally accompanied by thick fog, parts with its moisture in passing over the heated land of Nova Scotia, and becomes a hot dry wind off its northern coast. It becomes tempered in its passage over the water of the Strait, heated and dried again in some degree in passing over the island, but acquires again its moist and foggy character long before it reaches the coast of Labrador, and not unfrequently before it arrives at the Magdalen islands.

Prince Edward island is a colony with a distinct government. The population at the last census in 1841, amounted to nearly 50,000. In 1856 the population was estimated at 71,496, and the total amount of imports was 237,126*l.*, and of exports 258,860*l.* The export trade of the island consists of agricultural produce, lumber, and new vessels; the valuable fisheries off its coasts have been hitherto neglected, or prosecuted only to a very limited extent for home consumption: they are however now beginning to attract attention. The seat of government is at Charlottetown.

NORTH POINT.—The northern point of Prince Edward island is of low red cliffs. It has a reef extending from it to the northward and eastward $1\frac{1}{4}$ miles to the depth of 3 fathoms, and nearly 2 miles to 5 fathoms; moreover rocky and irregular soundings from 6 to 7 fathoms continue for several miles farther out to the north-east, causing at times a dangerous breaking sea, and terminating in a small patch of rocks, on which there is little more than 4 fathoms in low spring tides, and which bears from the North point N.E. $4\frac{1}{4}$ miles. Vessels should therefore always give this reef a wide berth in thick weather, or at night, and this, the soundings in the Admiralty chart will enable them to do; it is therefore only necessary to add, that it is most steep on the west side, where there are 10 fathoms at the distance of one-third of a mile. The inner part of the reef dries out half a mile from the point, affording shelter to fishing schooners which shift from side to side as the wind changes.

The west coast of Prince Edward island, from the north to the west point (a distance of 33 miles S.W. by W.) is unbroken, and formed of red clay and sandstone cliffs, with intervening sandy beaches affording landing for boats in fine weather. There are several ponds where boats can be secured, such as Nail and Black ponds, and North and South Minimegash, but their outlets through sandy beaches, are all nearly dry at low water and of no use to vessels. The shallow water runs out to considerable distances off various parts of this coast, and, as a general

rule for large ships, it should not be approached nearer than the depth of 11 fathoms at night, or in thick weather.

Off Nail pond and Nail head, 6 miles S.W. by W. from North point, the shallow water extends 2 miles from the shore.

MINIMEGASH REEF is a ledge of rocks nearly dry at low water, and nearly a mile in length parallel to the shore, from which its outer edge is distant half a mile. It lies directly off the sandy beach, and across the outlet of North Minimegash pond, which is 15 miles from North point. There are $2\frac{1}{2}$ fathoms water between the reef and the shore, and vessels have in one or two instances been moored there during the summer months to take in cargoes of lumber; but it is a very unsafe place.

WEST REEF is a narrow and rocky ridge 4 miles long north and south, and with irregular soundings from $2\frac{3}{4}$ to 5 fathoms. The least water, 16 feet, is near the middle of the reef, and there are 18 feet near its southern extreme, which bears from West point N.W. $\frac{1}{2}$ W. $3\frac{1}{2}$ miles, and is distant $2\frac{1}{2}$ miles from the nearest part of the shore. Its northern end is $3\frac{1}{2}$ miles off shore at the highest part of the cliffs between Macwilliam cove and Cape Wolfe.

There are no leading marks for this reef, and as there are 13 fathoms in one part close to its outer edge, it is very dangerous to ships rounding West point, and can only be certainly avoided at night, or in thick weather, by following the edge of the bank of soundings off the mainland in 9 or 10 fathoms, which will lead past it at the distance of 3 miles to the westward. There is a passage within the reef, between it and the West spit, but it is narrow with irregular soundings and strong tides, and should therefore never be attempted in a large vessel.

TIDES.—It is high water, full and change, at West point, Prince Edward island, at about $6\frac{1}{2}$ hours, the rise being 4 feet in springs, and 2 feet in neaps. But the strength and direction of the tidal streams about the West reef are very irregular, being influenced by winds, varying also with the time of tide, and probably with the age of the moon; as may be inferred from the peculiar tides at Richibucto and Shediac (pages 46, 52); and which also occur in Egmont bay. In the deep water channel passing close on the outside of the West reef, the rate of the stream sometimes amounts to $2\frac{1}{2}$ miles per hour, causing a heavy sea when running against the wind. The usual strength and direction is shown by the arrows on the chart.

WEST SPIT.—The west spit of sand upon sandstone, covered in some parts with only a few feet of water, runs out from West point 3 miles to the N.N.W., and then trends N. by E. within the West

reef, so that the latter overlaps it at the distance of half a mile. There is a "cul de sac" between the spit and the shore, open to the northward, and in which there are from 6 to 4 fathoms water. The only way to avoid getting into this opening, or within the West reef, when running from the northward, is not to approach the island nearer than the low water depth of 11 fathoms.

WEST POINT.—The western point of Prince Edward island consists of sand hills 12 feet high. Excepting in the direction of the spit, the shallow water does not extend far from it, and there is good anchorage under it in winds from between North and East, in 4 fathoms, fine sand bottom.

EGMONT BAY is formed between West point and Cape Egmont, which bears S. by E. $\frac{3}{4}$ E., and is distant 17 miles. It is 8 miles deep, and affords excellent anchorage with off-shore winds, in from 4 to 7 fathoms, over sand and clay bottom; but vessels should not anchor in less than 5 fathoms anywhere excepting on the north-west side of the bay, because there is rocky ground, with only $3\frac{1}{2}$ fathoms water off the river at its head, lying just within the 5 fathoms line, and at a distance of 3 miles from the shore, whilst along the eastern shore 5 fathoms would be too near the edge of the shoals.

On the northern shore of the bay, Wolfe and Brae rivers are sandy places dry at low water.

Percival and Enmore rivers at the head of the bay, are also only useful to boats and very small craft, having a depth of only 4 to 7 feet at low water, and being approached by exceedingly narrow and intricate channels through flats of sand, clay, and oyster beds, which are dry in part at low water, and extend $1\frac{1}{2}$ miles from the shore. The tides flow about 5 miles up these rivers, between low and marshy banks.

The eastern side of Egmont bay should not be approached to a less depth than $5\frac{1}{2}$ fathoms in a large vessel, for the shallow water off Rock point and the bar of St. Jacques extends a mile from the shore. The church of St. Jacques is conspicuously situated 5 miles to the northward of Cape Egmont, having the French or Acadian settlement along the ridge to the northward of it, and the small river St. Jacques, with its saw mills, half a mile from it in the opposite direction. Haldimand river shallow and running in to the southward about 2 miles, is about half way between the church and Cape Egmont, and has sand hills on its west or outer point of entrance. From those sand hills a sand bar, dry at low water, extends 3 or 4 miles to the northward parallel to the shore, having very narrow channels through it, which are said to shift at times during heavy westerly gales. At the time of the Admiralty survey the principal

channel was pointed out by two small beacons on the shore, about a mile to the southward of the church. The course in, with those beacons in one, was S.E. $\frac{3}{4}$ E., turning short to the southward within the bar into a harbour for small schooners, with 5 feet in it at low water, and extending to the entrance of Haldimand river.

CAPE EGMONT is a remarkable headland with cliffs of sandstone 50 feet high. About a mile to the northward of it will be seen the Dutchman, an insulated rock 30 feet high, and lying at the distance of a cable from the shore. The cape itself is quite bold to the southward; but to the westward there is shallow rocky ground half a mile off shore, and which should not be approached nearer than the depth of 6 fathoms at low water.

EGMONT BANK, of fine red sand, and with 4 fathoms least water, is very narrow, and $2\frac{1}{2}$ miles long in a S.S.E. and N.N.W. direction. Its northern end bears W. by N. $\frac{3}{4}$ N. 5 miles from Cape Egmont, its southern end W. $\frac{3}{4}$ S. 4 miles from the same headland, and there are as much as $8\frac{1}{2}$ fathoms and a clear channel between it and the cape.

From Cape Egmont to Sea Cow head, the course is S.E. $\frac{1}{4}$ E., and the distance $14\frac{1}{2}$ miles. A bank of comparatively shoal soundings commences at the former, and terminates at the latter headland, curving to the southward, so as to extend to the distance of $3\frac{1}{2}$ miles off shore; its southern edge, in 5 fathoms, forms an excellent guide for vessels at all times; but if of large draught they should be careful of venturing within that depth, since there are only $3\frac{1}{4}$ fathoms, with rocky bottom, in one part.

FIFTEEN POINT.—The church and village at this point, stand near the shore, $4\frac{1}{4}$ miles to the eastward of Cape Egmont, and can be seen at great distances, either from the eastward or westward. At the extremity of the point, one mile to the eastward of the church, there is a low rock above water, called the Little Dutchman, and shallow water to the distance of a long mile off shore; the depth then increases to near 4 fathoms for 2 miles farther off, and then decreases again to $3\frac{1}{4}$ fathoms over sandstone bottom not far from the edge of the bank, the church bearing from the shallow part nearly South, and being distant 3 miles.

SANDBURY COVE, 9 miles to the eastward of Cape Egmont, is an extensive place, but nearly dry at low water, excepting a narrow channel through the flats only fit for boats or very small craft. Muscouche point is the eastern point of this cove; and Muscouche church will be seen to the north-east of it, at the distance of 2 or 3 miles inland.

MUSCOUCHE BANK dries out to the distance of $1\frac{1}{4}$ miles from Muscouche point, and extends $2\frac{3}{4}$ miles to the southward to the depth of 3

fathoms, sheltering the roadstead in Bedeque bay, outside Bedeque harbour, from westerly winds. The northern extremes of Indian head, and Indian island in one, bearing E. ½ N., clear the south point of the spit in 14 feet water, but the lead will be a sufficient guide when a greater depth is required.

BEDEQUE HARBOUR, situated in the bay to the northward of Sea Cow head, runs in to the eastward between Indian head and Phelan point; the former, the south point of entrance, will be easily distinguished, being faced by sandstone cliffs 25 feet high, and rising to double that height, a short distance back from the shore, whilst the other is comparatively low and wooded. The entrance between these points is 1¼ miles wide, but the Indian spit, which dries out half a mile from the head, and the shallow water off the opposite shore, leave only a narrow channel into the harbour. Indian island is a mile within the entrance, having no passage to the southward of it, and the island shoal extending from it 4 cables in the opposite direction. The channel passes to the northward of this shoal, and then turns to the southward, within or to the eastward of the island, where vessels may lie quite landlocked in 5 fathoms water.*

A depth of 20 feet at low water, ordinary spring tides, can be carried into the harbour, and, since the tides rise from 5 to 7 feet, there is water enough for vessels of large draught; but the channel is rendered so intricate by the Island shoal and Middle ground, which lies a little farther out on the opposite side of the channel, that no directions would enable a stranger to enter this harbour without great risk of accident. In the year 1856, 55 vessels (2,362 tons burthen) entered inwards, and 65 vessels (3,545 tons) cleared outwards; the total value of imports was 11,397*l.*, of exports, 9,397*l.*

LIGHT.—A small *fixed white* light is exhibited from a lantern on a pole on Green's wharf, on the northern shore of Bedeque harbour; and it is said to be visible from a distance of 7 miles.

DIRECTIONS.—As the assistance of a pilot and of buoys is indispensable to enter Bedeque harbour, it would be advisable to anchor in the bay or roadstead outside, until the former could be obtained. The anchorage in the roadstead in 22 feet at low water, sand and clay bottom, is quite safe during the summer months, although open to south-west winds; the shallowness of the water, and the land at the distance of 4 or 5 leagues preventing any very heavy sea from coming in. Should, however, any extraordinary circumstances render it expedient to attempt running into the harbour, the best mode of proceeding would be, to run along the south-eastern edge of the Muscouche shoal, and then eastward along the northern side of the channel, by the lead, in the low water depth of 18

* *See* Plan of Bedeque Harbour, No. 1,942; scale, *m* = 3 inches.

feet, until Indian and Graham heads come in one, bearing S.S.W. ¼ W., when the vessel should be immediately rounded to, with her head to the southward, and anchored in about 4 fathoms, mud bottom; she will then be about 4 cables within Indian spit, and in safety.

If the vessel be approaching from the eastward with an easterly wind, Sea Cow head may be safely rounded at the distance of 2 or 3 cables, Graham head may be passed at twice that distance, and then the edge of the shallow water off Salutation cove may be safely followed by the lead, till Indian head is approached, where the shoal becomes very steep, as is also Indian spit, which however can frequently be seen, being dry at low water.

At a short distance within Indian island the harbour is divided into two arms, of which the northern, Wilmot river, has only 2 or 3 feet water in it, and is obstructed by oyster beds, and crossed by a bridge 2 miles from the island. Vessels can ascend the southern arm 1¼ miles beyond the island; the channel then becomes obstructed by oyster beds, so as to leave only an intricate channel carrying 4 feet at low water; through which the new vessels built at Mr. Pope's building yard, 1½ miles higher up on the south shore, are taken at high water. Half a mile above Pope's wharf this arm, which is called Dunk river, divides into two narrow and shallow channels, crossed by bridges at the distance of a mile.

TIDES.—It is high water, full and change, at Green's wharf on the north shore of Bedeque harbour, at 10h., the rise being 7 feet in spring and 5 feet in neap tides.

SEA COW HEAD, CARLETON HEAD, and CAPE TRAVERSE.—The points between these headlands, to the south-east of Bedeque, are formed of red sandstone and clay cliffs, with coves between, affording shelter and landing for boats, and also anchorage for small craft, with the wind off the land, or in fine weather. The shallow water does not extend beyond 3 cables off either of these headlands; but in the bays its 3 fathoms edge is sometimes twice that distance from the shore; and as the line of 5 fathoms is sometimes quite close to it, the general rule for vessels at night should be not to approach nearer than the depth of 7 fathoms. In the old charts a shoal with 3 fathoms water is shown off Carleton head; but a diligent search proved that it has no existence.

In the first 4 miles eastward from Cape Traverse there are three coves, namely, Provost, Augustin, and Cumberland coves, which are separated by points of cliff, and are dry at low water.

TRYON RIVER lies a mile to the eastward of Cumberland cove, between Tryon head and Birch point, and is approached by a very narrow channel through the western side of the Tryon shoals. There

is a foot water over the bar of this channel at low water in spring tides; but the depth increases to 11 or 12 feet for a short distance within, and then the channel becomes still narrower, winding through flats of sand, mud, and weeds to the bridge, a distance of nearly 3 miles, following the channel. Small schooners enter the Tryon, with the assistance of the tide, which rises from 6 to 8 feet; and there are flourishing farms on each side of the river.*

TRYON SHOALS, of sand upon sandstone, dry out $1\frac{1}{3}$ miles off-shore, between the Tryon and Brockelsby rivers; and their south-west extreme, in 3 fathoms, bears S. by W. $\frac{1}{2}$ W., and is distant $2\frac{1}{4}$ miles from Tryon head, the nearest part of the shore. At the distance of one-third of a mile N.E. from the south-west point of the shoal, there are only 2 feet water over rocky bottom, and at twice that distance the sands are dry at low water. The south-west point is steeper than any other part of these shoals, having $4\frac{1}{2}$ fathoms close to; but there is, nevertheless, sufficient warning by the lead, since the depth of 5 fathoms is nowhere less distant than half a mile from their edge.

There is, moreover, an excellent leading mark, namely, Cape Traverse and Carleton head in line, bearing N.N.W. $\frac{3}{4}$ W., which clears the south-west point of the shoals in 5 fathoms, and at the distance of a long half mile. Farther eastward, these shoals may be safely approached to any convenient depth by the lead, which should never be neglected when in their vicinity, for the tides round the island meet off them, causing variations in the strength and set of the streams, which it would require long-continued observations to understand or account for. The stream of ebb out of Bay Verte frequently sets over towards these shoals, so that a vessel standing along the land with a scant southerly wind will often find herself dropping to leeward towards them much faster than her usual amount of leeway would lead her to expect.

CRAPAUD ROAD is a small but secure anchorage off the mouth of Brockelsby river, and between the eastern part of the Tryon shoals and the land. The space in which vessels may ride in from 12 to 15 feet at low water is about half a mile long and 2 cables wide; but the anchorage for small craft, in from 7 to 9 feet, is more extensive, continuing nearly a mile farther to the westward in a narrow channel or cove in the sands which dry at low water. The entrance to this road between the eastern point of the Tryon shoals and the shallow water off the shore to the eastward, is only 180 yards wide, and carries 9 feet at low water spring tides.

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* *See* Plan of Crapaud Road, No. 2,000; scale, $m = 3$ inches.

Brockelsby river is all dry at low water, excepting a very narrow winding channel through mud flats, by which boats can ascend to the bridge $1\frac{1}{4}$ miles from the entrance. The land rises to the height of 250 feet from the eastern bank of this river; and the neighbouring country is pleasing and well settled.

DIRECTIONS.—To run for Crapaud road bring the two white *beacons* which stand on either side of the entrance of Brockelsby river in one, bearing N. $\frac{1}{4}$ E., and run towards them until Wright's barn comes on with the western side of Paul bluff, bearing N.W. $\frac{2}{3}$ N.; when steer towards the last-named objects, keeping them exactly in one; and when the vessel has run a cable's length, the marks for the steep northern edge of the Tryon shoals will come on, namely, Richard point (the extreme to the westward) in one with Birch point, bearing N.W. by W. $\frac{1}{2}$ W. Steer towards Paul bluff and Wright's barn for the distance of 2 cables farther; then towards Birch point or W.N.W.; and when the vessel has run a cable's length, let go the anchor, and she will be in the best berth, and in from 13 to 15 feet water, over sand and mud bottom which holds well. No sea of consequence ever comes into this anchorage, the sands outside being covered only to the depth of a few feet at high water; and the shallow water to the eastward, off Inman point and Brockelsby head, overlapping the entrance.

TIDES.—In Crapaud road it is high water, full and change, at 10h., and the rise is 8 feet in spring and 6 feet in neap tides; there is, therefore, a depth of from 15 to 17 feet at high water in the entrance or on the bar of the road. The tidal streams are weak and irregular; in general their rates do not exceed half a knot at the anchorage, but they sometimes amount to $1\frac{1}{2}$ knots for a short time along the edge of the shoals and in the entrance.

INMAN ROCK.—Brockelsby head, 9 miles S.E. by E. from Cape Traverse, is the eastern point of the bay in which Brockelsby river and Crapaud road are situated. It has clay cliffs, 15 feet high, based upon sandstone, which runs out a mile to the southward, forming a dangerous reef, which must be carefully avoided by vessels approaching Crapaud from the eastward.

Inman rock, with 4 feet least water, lies near the outer point of this reef, South two-thirds of a mile from Brockelsby head, and has from 13 to 19 feet of water around it. Large vessels should not approach it nearer than the low water depth of $4\frac{1}{2}$ fathoms.

MARLE HEAD and SABLE COVE.—Marle head, $2\frac{1}{2}$ miles S.E. from Brockelsby head, has also a reef running out from it nearly a mile, and which should not be approached nearer than the depth of 5 fathoms.

Sable cove, between the two last-named headlands, is nearly dry at low water, and crossed by a bridge one mile from its entrance.

From Marle head to St. Peters island, a distance of 9 miles to the eastward, the coast is straight and unbroken, and may be approached by the lead to 5 fathoms water; bearing in mind that that depth is occasionally within 2 cables of shallow water, extending in some places three-quarters of a mile from the shore.

HILLSBOROUGH BAY, having in it the principal harbour and capital town, and being the outlet of an extensive inland navigation, is the most important, as well as the largest, of any in Prince Edward island. The numerous dangers it contains, having hitherto been imperfectly known and represented, have rendered its navigation extremely difficult to strangers in a large ship; but this will now be obviated by the Admiralty chart, accompanied by the following directions. The objects and dangers belonging to the main line of navigation, and which are on either side of the channel leading to Charlottetown harbour, will first be briefly described, then the eastern part of the bay.*

LIGHTS.—The lighthouse on Prim point, the south-east point of Hillsborough bay, is of brick, of a conical form, 50 feet high, and coloured white.† It stands at 100 yards within the south-west extreme of the point, and exhibits, at an elevation of 68 feet above the sea at high water, a *fixed white* light, which in clear weather should be seen from a distance of about 13 miles. It is of the greatest use to vessels, especially when approaching from the eastward, guiding them, by its bearing, clear of the Rifleman and Pinette shoals, and enabling them to enter the bay in the darkest night.

A small *fixed white* harbour light is also shown from the roof of the block house on Blockhouse point, the eastern outer point of entrance to Charlottetown harbour. The light is visible from a distance of 9 miles.

WEST SIDE of CHANNEL to CHARLOTTETOWN HARBOUR.—St. Peters island, lying off the western point of entrance to Hillsborough bay, is rather more than 3 miles in circumference, and of very moderate height, having cliffs of red clay and sandstone, 35 feet high, along its eastern shore. There are several farms on either side; but the central parts of the island are thickly wooded. It is joined to Rice point, the western point of the bay, and from which it is distant $1\frac{1}{4}$ miles, by sands dry at low water; boats, therefore, can only pass between it and the shore with the assistance of the tide.

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* *See* Plans:—Hillsborough Bay, with views, No. 1,738; scale, $m = 2$ inches; and Charlottetown Harbour, No. 1,709; scale, $m = 4$ inches.

† *See* Views on Plan.

Shallow water extends off this island $1\frac{1}{4}$ miles to the S.W. and South; but the soundings, deepening out gradually, afford ample guidance in that part. Farther eastward the St. Peters shoals become much more extensive, stretching out $3\frac{1}{4}$ miles E. by N. from the north-east point of the island. For the first 2 miles of that distance St. Peters spit of sand dries out, affording shelter to St. Peters road fit only for small vessels, having only from 9 to 12 feet at low water. The Spit-head, a rocky shoal, with 8 feet least water, lies off the end of St. Peters spit, and extends to within a quarter of a mile of the east extreme of the St. Peters shoals, where the Spit-head *beacon buoy* is moored in 5 fathoms, with the west side of the Government house in Charlottetown in line with Battery point, bearing N. $\frac{1}{2}$ E.; the north side of St. Peters island W. $\frac{3}{4}$ S.; and Gallows point just open to the northward of the dry spit of Governor island, S.E. $\frac{1}{2}$ E.; but this dry spit can seldom be seen, and bearings alone to such distant objects are insufficient; therefore a beacon should be placed on the flat off the end of the dry spit, so as to form with Gallows point a cross mark to to ensure the same position for the buoy every year.

The 5 fathoms edge of the bank, forming the western side of the channel into Charlottetown harbour, trends North $2\frac{1}{4}$ miles from the Spit-head buoy to about a cable's length off Blockhouse point, at the entrance of the harbour. The edge of the St. Peters shoals may be safely followed by the lead in 5 fathoms as far in as the Spit-head buoy; after which the bank becomes steep, and must be approached with caution in a large vessel.

The Trout rock, with 7 feet least water, lies 2 cables within the edge of the bank, and a long half mile out from Block-house point, which, kept in line with Government house, bearing N. by E. $\frac{1}{4}$ E., will just lead to the eastward of the rock in about 14 feet water.

EAST SIDE of CHANNEL.—Prim point, the south-east point of Hillsborough bay, is low, with cliffs of sandstone, 10 to 15 feet high, and may be recognized by the lighthouse which, as before stated, stands 100 yards within the south-west extreme of the point. Prim island, which has also low cliffs, is distant $1\frac{1}{4}$ miles E.N.E. from the extremity of the point, and is united to its north side by sand beaches, inclosing marshy ponds.

Prim reef, of sandstone, runs out to the westward, both from the island and the point, so as to form a forked reef, with very uneven soundings; its northern point, in 3 fathoms, bears N.W. by W. $\frac{1}{2}$ W., 2 miles from the lighthouse, and the other point W. by S. $1\frac{1}{4}$ miles; but if the reef is considered as bounded by the depth of 5 fathoms (which is the depth for a large ship), it is much more extensive, reaching out to the distance of 3 miles.

The square tower of the Scotch church at Charlottetown, in line with Battery point, bearing N. by E. $\frac{1}{4}$ E., will lead to the westward of the 3 fathoms extreme of Prim reef ; and the same church tower, in line with Blockhouse point, bearing N. by E. $\frac{1}{2}$ E., will clear the whole of the reef ; but it is only in very favourable weather that such distant objects can be seen, and, therefore, the lead must be the main dependence ; the soundings, combined with the bearing of the light, being amply sufficient for rounding the reef, as will be seen in the chart.

Governor island, lying in the middle of Hillsborough bay, is low, in great part wooded, based upon sandstone, and has dangerous shoals round it on all sides.

The Governor shoals, extending from Governor island to the south-west, and adding greatly to the dangers of the navigation, require especially to be noticed. Stretching out from the west end of the island, the sandstone reef is dry at low water for the first half mile, and has less than 3 fathoms for an equal distance farther ; after which rocky and irregular soundings continue to the west extreme of the shoals, in 5 fathoms, distant 2 miles from the island. A *beacon buoy* is moored in 4 fathoms, a cable's length within the west extreme of the shoals ; with the square tower of the Scotch church at Charlottetown and Battery point in line, bearing N. by E. $\frac{1}{4}$ E. ; and the north-west extreme of Governor island and Pownell point touching, and bearing E. by N.

The Fitzroy rock, with 20 feet least water, lies about a cable's length to the eastward of the above buoy, and was considered the principal danger off the island, until the Admiralty survey led to the discovery of the much more dangerous rocky patches which are scattered over these shoals farther to the southward.

Of these patches, the Huntley rock, bearing S. by W. $\frac{1}{2}$ W., $1\frac{3}{4}$ miles from the west end of Governor island, has the least water, namely, 12 feet at low tide ; but there are others, with from 17 to 22 feet water, as far out as $2\frac{1}{2}$ miles, and the south-west extreme of the shoals in 5 fathoms is distant $3\frac{1}{2}$ miles from the island. The mark for the above beacon buoy, namely the Scotch church and Battery point, bearing N. by E. $\frac{1}{4}$ E., leads along and clears the west side of the Governor shoals in 5 fathoms, excepting the small portion of the west extreme to the westward of the buoy.

On the eastern side of the channel into Charlottetown harbour, to the northward of Governor island, the shallow water is continuous, from Sea Trout point, at the entrance of the harbour, to Governor island, there being only a passage for boats or small craft between that island and the land to the north-east of it. The edge of the bank, in 5 fathoms, runs to the south from Sea Trout point to abreast the Spit-head buoy ; consequently parallel, in this part, to the bank on the opposite side, leaving a channel with 7 to 12 fathoms water, and either one-third of a mile or half

a mile wide, according as it is conceived to be bounded by the 5 fathoms or 3 fathoms line of soundings.

The Squaw shoal, with 10 feet least water, approaches close to the edge of the bank, where it is most steep, and is nearly opposite the Spit-head buoy. Battery and Sea Trout points in one, bearing North, form an excellent mark for this side of the channel, leading along the edge of the bank, in $4\frac{1}{2}$ fathoms least water, from near Sea Trout point, to a quarter of a mile beyond the Spit-head buoy on the opposite side; but it had better not be followed farther to the southward in a large ship, although smaller vessels may do so, until Governor island and Gallows point are touching; bearing in mind that it finally leads over the reef off the west end of the island.

CHARLOTTETOWN HARBOUR is $4\frac{1}{2}$ cables wide at entrance, between the cliffs of Blockhouse and Sea Trout points; but shallow water, extending from both shores, reduces the navigable width of the channel, reckoning from the depth of 3 fathoms, to about $2\frac{1}{4}$ cables; and as the shoals are very steep, it would require to be well buoyed before a ship of large draught could beat in or out with safety. Cliffs of red sandstone, from 10 to 30 feet high, form the shores on either side, the land rising gradually from them in undulations, and being partly cultivated and partly wooded. An old blockhouse and signal post stand on Blockhouse point, the west point of entrance. The next point of cliff on the west side of entrance is Alchorn point, and at the distance of half a mile from the blockhouse are the remains of Amherst fort, on the hill, 93 feet above high water. On the same side, north of Alchorn point, is Warren cove, and lastly, Canseau point, with its *white beacon*, $1\frac{1}{4}$ miles from the blockhouse. Canseau shoal extends off Canseau point to the distance of $3\frac{1}{2}$ cables, and will be cleared by keeping the blockhouse just open, clear of Alchorn point; observing that the extremes of the cliffs of Blockhouse and Alchorn points in one, lead over the point of the shoal in 16 feet at low water.

On the opposite or eastern side of the entrance, and less than a mile within Sea Trout point, is Battery point, with its shoal; the latter running out 2 cables, and having on its extreme point a *buoy* moored in 3 fathoms at low water. Outside that depth, on either side, the water deepens abruptly, and there are 13 fathoms in the middle of the channel. The *red* beacon and Scotch church tower at Charlottetown, clear the shoal off Battery point in 10 fathoms, and at the distance of 120 yards. Within the harbour, in addition to the flats of mud and weeds extending off shore, there is the Middle Ground, with 17 feet least water, and for the situation of which the seaman is referred to the plan of the harbour; it may be well, however, to notice that the white beacon on Canseau point

and McKinnon's loghouse in line, lead through midway between it, and the flat off the southern shore.

Immediately within Canseau and Battery points, which are the inner points of entrance, the channel expands into one of the finest harbours in the world, having depth and space sufficient for any number and description of vessels. In sailing in, York river will be seen running in to the northward; the Hillsborough river stretching away to the E.N.E. as far as the eye can reach; and Elliot river running in to the westward. The confluence of the streams of these three rivers, between Canseau shoal and the mouth of York river, form the Three Tides, where there is excellent anchorage, used occasionally by laden vessels preparing for sea, the usual anchorage being off the wharves of the town, where the channel is $2\frac{3}{4}$ cables wide, and carries nearly 10 fathoms water.

Of the three rivers which unite in the harbour, the Hillsborough is the largest, being navigable for vessels of the largest draught to the distance of 7 or 8 miles, and for small vessels 14 miles above Charlottetown, where there is a bridge 2 miles from the head of the river. There is a portage of less than a mile across, from the Hillsborough near its head to Savage harbour on the north coast of the island. York river, the smallest of the three, is crossed by Poplar island bridge, $2\frac{3}{4}$ miles from its mouth. Elliot river may be ascended 4 or 5 miles by large vessels, and 9 or 10 by small craft and boats. The shores of all three rivers are settled, and the country generally fertile.

CHARLOTTETOWN, which is now a city, is advantageously situated on the northern bank of the Hillsborough river, a short distance within its entrance, and at the point where the deep water approaches nearest to the shore; its wharves, however, still requiring to be 240 yards long to reach the edge of the channel. The city is extremely well laid out, with spacious squares and wide streets at right angles; but these are as yet thinly occupied by houses of the rapidly increasing population. The new Provincial building, occupying the centre of the principal square, is the only stone erection in the place. The houses, with the exception of 9 or 10 which are of brick, are all of wood; and so also are the churches and the chapels. The Scotch church, with its square white tower, will easily be distinguished, being the most to the westward, and appearing with the red beacon (used with it as a leading mark, and standing close to the water), on the left side of the city. Still farther to the left will be seen the Government house, by itself, and distinguished by its colonnade.

No part of the city exceeds in elevation 50 feet above the sea at high water; but the land rises gradually behind it to the height of 150 feet at

the distance of $1\frac{1}{2}$ miles, and is well cultivated, whilst yet sufficient wood has been preserved to give to the country an agreeable and park-like appearance.

The site of Charlottetown, as the capital of the island, and the seat of the provincial government and legislature, appears to have been extremely well chosen, whether in regard to its almost central position, its extensive inland communication by means of the rivers which unite their streams before it; or the superiority of its harbour, which possesses, moreover, the important advantage of having the greatest rise of tide in the Gulf anywhere below Cape Chatte, with the exception of Campbell town in the Restigouche, which is inaccessible to vessels of large draught. All kinds of supplies may be obtained at Charlottetown, but water only from wells with pumps, which are numerous in the town. In the year 1856, 619 vessels (35,931 tons burthen) entered inwards, and 603 vessels (42,365 tons) cleared outwards; in the same year the total value of imports amounted to 182,499*l.*, and of exports to 54,090*l.* In 1858 the population was about 8,000.

TIDES.—In Charlottetown harbour it is high water, full and change, at 10h. 45m., and ordinary springs rise $9\frac{1}{2}$ feet, and neaps 7 feet. Their rise is considerably influenced by the winds, so that spring tides during north-east gales have risen 11 feet, and neaps during south-west gales only 6 feet; but these are extraordinary cases. The range of the neap tides has been at times less than 3 feet. The duration of the two tides is nearly equal, and their streams continue about a quarter of an hour after high and low water by the shore; running usually at the rate of $1\frac{3}{4}$ knots off the town, and $2\frac{1}{2}$ knots in the entrance of the harbour.*

DIRECTIONS from the EASTWARD.—Vessels bound to Charlottetown from the eastward with a fair wind will avoid the Rifleman reef by attending to the soundings in the chart, and by not bringing the light on Prim point to bear to the westward of N.N.W. A large ship should

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* As the observations on the tides were continued here hourly, through 11 semi-lunations, with an accurate tide-gauge, it may be useful to put on record the following results:—

The Corrected Establishment was 10h. 18m. The a.m. tide, however, was found to be 10h. 24m., and the p.m. tide 11h. 7m., after the moon's transit: the mean being 10h. 45m. The mean duration of the flood (by 294 observations) was 6h. 14m.; and of the ebb 6h. 11m., the flood being rather the longest; as if the evaporation more than compensated for the trifling supply of fresh water afforded by the small streams which discharge into the sea-creeks or inlets. It is worthy of remark that the diurnal inequality in the heights of the alternate flood tides, so strongly exhibited at Pictou, &c., is here only slightly shown, but may be plainly observed in the ebb tides, or in the difference of the levels to which the alternate tides descend.

round Prim reef by the lead in 10 fathoms water ; a smaller vessel may go nearer with attention to the soundings.

When the light bears to the southward of E. by S. $\frac{1}{4}$ S., (the vessel being in not less than the low water depth of 10 fathoms,) or when the north side of Prim island bears E. by S. the most northern point of the reef will be past, and the course across the bay must be North or N. $\frac{1}{2}$ E. at night or in thick weather ; the object being to strike soundings on the southern edge of the bank off St. Peters island, and then to follow it to the north-eastward in 5 fathoms, until about 2 miles within the Fitzroy rock, where there is excellent anchorage off Governor island, and where the vessel had better wait for daylight. But if it be day and clear weather, and Prim reef has been passed as above directed, steer N. by E. $\frac{1}{2}$ E., attending to the soundings and the given leading mark, to avoid being set to the eastward too near the Governor shoals. If the Scotch church can be made out, (which it most probably will be before arriving near the Fitzroy buoy,) bring it in line with Blockhouse point, and keep it so until Governor island and Pownell point are touching, and bearing E. by N., when the Fitzroy buoy will be seen on the same bearing, and distant two-thirds of a mile.

Steer now N.E. by E. with the flood tide, or N.E. $\frac{1}{2}$ E. with the ebb, until the west side of Government house and Battery point come in one, bearing N. $\frac{1}{2}$ E., when alter the course towards them, taking care not to open out any more than the west side of Government house, and they will lead close to the eastward of the Spit-head buoy, which having passed, continue running on the same leading mark until Dockendorf house* comes in line with Canseau point. Keep this house only just in sight, in running towards it, until the vessel is within Blockhouse and Sea Trout points ; then sheer a little to the eastward, sufficiently to open out Dockendorf barn as well as Dockendorf house, 2 or 3 degrees to the eastward of Canseau point. Keep the house and barn so open, steering about N. by W. $\frac{1}{2}$ W., and as soon as the red beacon and Scotch church come in line, steer for them, and they will lead past the buoy on the Battery point shoal, and between the latter and the Canseau shoal, until the white beacon on Canseau point and McKinnon's log-house come in one. The last-named marks kept in line astern, will lead through between the Middle Ground and the flat off the southern shore to the anchorage in mid-channel off the wharves of the town.

From the WESTWARD.—Approaching from the westward with a fair wind, bring Governor island and Pownell point to touch,† bearing E. by N.,

* *See* Plan of Charlottetown Harbour, No. 1,709.

† See View on Plan, No. 1,738.

and run for them until the Scotch church comes in sight, and in line with Blockhouse point, bearing N. by E. ½ E.; when steer N.E. by E. or N.E. ½ E., according as it may be flood or ebb tide, until the west side of Government house and Battery point come in one, bearing N. ½ E., and then proceed as before directed.

If the leading marks cannot be made out, follow the southern and eastern edge of the St. Peters shoals in 5 fathoms up to the Spit-head buoy, and then proceed as before directed.

With BEATING WINDS little difficulty will be experienced, if attention be paid to the soundings in the Admiralty chart, and to what has been said of the Prim reef and the Governor shoals. On approaching the narrow part of the channel, the buoy, or the leading marks, will point out the position of the Fitzroy rock, the vessel making short boards off and on the edge of the St. Peters shoals, until more than a mile within it; after which, (and in addition to the lead,) the west side of Government house and Battery point in one, will show when to tack in the board to the westward, until well within the Spit-head buoy; and Battery and Sea Trout points in one, will do the same on the east side of the channel, until the vessel arrives close off the entrance of the harbour. It has been already remarked, that more buoys would be required before a vessel of large draught could safely beat in and out through the entrance; and even in smaller vessels it is necessary to be well acquainted with the place, and to be constantly on the guard against the flawing and unsteady wind which so commonly prevails there. The light on Blockhouse point enables the mail steamer to enter the harbour at night; but the buoys would require to be seen for the safety of large sailing vessels.

SQUAW BAY.—The eastern part of Hillsborough bay being out of the principal line of navigation, is but little frequented by shipping. On this account, and also because it abounds with dangers so that no directions would avail, a brief description will only be given, pointing out the positions of the principal dangers, and generally the nature of the navigation. The services of competent pilots would be there indispensable; but this is not easy to find at present, there being only three persons, including the harbour master of Charlottetown, who can with any degree of propriety be termed pilots for this bay; and the amount of trade hitherto has not been sufficient to furnish them with much experience, or that precise knowledge which would insure the safety of a large ship. To the north-east of Governor island, under shelter of the shoal at its east point, and off the mouth of the shallow Squaw bay, there is good anchorage for small vessels, in from 9 to 12 feet with mud bottom.

POWNELL BAY requires but a brief notice, being shallow and open to westerly winds; it affords shelter to small craft and boats near its head, which dries extensively at low water.

Gallows point, separating Pownell and Orwell bays, has a long reef of sandstone, and extensive shoals off it, on which are scattered rocks covered with only a few feet water. These shoals extend in the direction of Governor island, to the distance of 2 miles, and also a long mile towards Prim point. There is, moreover, a detached shoal, with 13 feet least water, bearing W. $\frac{1}{2}$ N. 2 miles from Gallows point.

ORWELL BAY, leading to Orwell, Vernon, and Seal rivers, is 2 miles wide at its entrance, between Gallows and Buchanan points; the latter on the southern shore being 5 miles within or to the eastward of Prim point. In proceeding in from Prim island towards Orwell, the shallow water extends to greater distances from the shore, until at last it stretches nearly half-way across the mouth of Orwell bay. Its edge in 3 fathoms is there $1\frac{1}{4}$ miles out from the cliffs, and has a rock upon it, with 9 feet least water, which bears N.W. by W. a long mile from Buchanan point, and S.S.W. $1\frac{1}{2}$ miles from Gallows point. Between the shoals just mentioned, and those which stretch over to the southward from Gallows point, the channel is 4 cables wide and carries nearly 5 fathoms water, becoming shallower and narrower within the bay, until off McInnis point, ($1\frac{1}{2}$ miles in from the entrance and on the northern shore,) it suddenly contracts to less than one cable in breadth, and decreases in depth to 14 or 15 feet at low water, in spring tides. This is the bar which would require to be buoyed, as would also the channel, which becomes only a little wider within; the depth at the same time increasing to 7 or 8 fathoms between steep shoals on either side.

Just within China point (on the northern shore, and 2 miles within the bar) is the confluence of the Orwell and Vernon rivers, and there vessels may lie land locked, the channel being 170 yards wide, and carrying 5 fathoms water between mud flats dry at low tide. Vessels can ascend more than a mile up the Orwell and Vernon rivers, and new vessels are brought down the latter with the tide from a much greater distance; but both rivers are obstructed with oyster beds, at the distance of $1\frac{1}{4}$ miles from China point, and their channels higher up become very shallow and narrow, the Orwell being quite dry at low water; as is also Seal river, which enters the Vernon from the northward.

PINETTE HARBOUR, 4 miles eastward from Prim point (noticed in page 92), has only 2 feet at low water over its rocky and exceedingly dangerous bar. It is therefore fit only for small schooners, although it has from 3 to $4\frac{1}{2}$ fathoms in its narrow channel, which runs in several

miles through flats of mud and weeds, dry at low water, and then divides into several shallow branches. The bar is nearly a mile out from the entrance, and the Pinette shoals reach to double that distance; their outer point, in 3 fathoms, extending several cables' lengths beyond the line joining Prim point, and the extreme to the south-eastward, and bearing from Pinette point W.S.W. 2 miles. There are only 9 feet water just within this point, and only 3 feet at no great distance, the bottom being rock. These shoals are therefore very dangerous, and should not be approached nearer than the low water depth of 6 fathoms.

TIDES.—It is high water, full and change, at Pinette at 10h., and the rise is 8 feet in spring and 5 feet in neap tides.

FLAT RIVER, which is only fit for boats, is 3 miles to the south-east from Pinette harbour. Shallow water runs off Macdougal point, its eastern point of entrance, to the distance of a mile.

RIFLEMAN REEF, of sandstone, extends to the distance of 2 miles to the westward from Stewart point, which bears S.E. $\frac{1}{2}$ S. 9 miles from Prim point. On the extreme outer point of this reef, in 3 fathoms, the light on Prim point bears N.N.W $\frac{1}{2}$ W. 8 miles. Just within this point of the reef there are 8 feet water, and half-way between that and the shore only 5 feet, while between those and other shallow patches there are 12 feet at low water.

CAUTION.—The very irregular soundings off the Rifleman reef, and the deep water close to it (16 fathoms within less than half a mile, while there is a much less depth farther out), render it one of the greatest dangers in Northumberland Strait. The bearing of the light on Prim point will greatly assist vessels in avoiding it; but at all times, either by night or by day, and especially in thick weather, it should be approached with care. There are no leading marks to clear its west extreme, which has 7 fathoms close to; but the soundings give better warning there than farther to the southward. The wooded point, within and opposite the Wood islands, in one with Black point, the extreme to the eastward, bearing E.S.E., just clear the southern side of the reef; but the safest plan, when approaching it from the southward, will be to tack as soon as the extreme of the land to the eastward appears within the Wood islands, bearing E. by S. $\frac{1}{4}$ S., when the vessel will be $1\frac{1}{4}$ miles from the reef.

When standing towards the reef at night, take care that the light on Prim point is not brought to bear to the westward of N.N.W. If the light is not seen, a close attention to the soundings can alone ensure safety. It must be borne in mind, in standing across the Strait from the southward towards the reef, that after having had upwards of 20 fathoms towards the southern shore, the soundings will decrease to between 11

and 9 fathoms for several miles, and then suddenly increase again to from 14 to 16 fathoms. When the vessel arrives at this deep water she will be less than a mile from the reef, and if she ventures across it to 10 fathoms, she will be distant only 3 cables from its edge.

Bell point, a mile south-east of Stewart point, and the extreme from Prim point, is a cliff of sandstone 40 feet in height. The shallow water is continuous from the Rifleman reef to this point, from which it extends a mile to the 3 fathoms line, having 9 or 10 fathoms close to its edge.

INDIAN ROCKS, considering them to be bounded by the depth of 3 fathoms, occupy a space $1\frac{1}{2}$ miles in length, parallel to the shore between Bell point and the Wood islands, and half a mile in breadth. They are of sandstone, dry to a considerable extent at low water, and their southern edge is $1\frac{1}{2}$ miles off shore. The south-east point of the Wood islands, not brought to bear to the eastward of E.N.E., will lead to the southward of their south-east extreme, which bears S.W. by W. nearly a mile from the west end of the Wood islands; and Macdougal and Pinette points in one, bearing N. by W. $\frac{1}{2}$ W., will lead at the distance of three-quarters of a mile to the westward of the western extreme, which bears from Bell point S. by E. $1\frac{3}{4}$ miles; but Pinette point cannot always be distinguished.

The want of sufficient leading marks, and the deep water so close to the southward, would render these rocks exceedingly dangerous by day, as well as by night, if there were not almost always breakers or a rippling to be seen on the part which dries. In standing towards them at night, observe that there are 10 fathoms within a quarter of a mile of their southern edge; and that 13 fathoms is near enough to their south-east extreme, and 10 fathoms to their south-west point, taking care not to get between the latter and the Bell Point reef, where there are also 10 fathoms.

There is a channel between the Indian rocks and the shore more than half a mile wide, and carrying from 4 to 16 fathoms water; but it is of no use to shipping, the soundings being irregular, with rocky or gravelly bottom and strong tides. It may as well be added, that the extreme of the land to the eastward and the inner side of the Wood islands in one will lead in between the Bell Point reef and the rocks, and clear their northern edge in 5 fathoms; and that the line of Stewart and Bell points in one, bearing N.W. $\frac{1}{2}$ N., passes along their north-east side in 3 fathoms; the former of those points must therefore be shut in behind the latter to pass between the rocks and the Wood islands.

TIDES.—The tidal streams are strong in the deep water just outside the Indian rocks, frequently running at the rate of 3 knots per hour. It is high water, full and change, at $9\frac{3}{4}$ hours nearly, the rise being 6 feet in spring and 4 feet in neap tides.

WOOD ISLANDS are now only in part covered with timber, there being at present two families residing on them, who have cleared the greater part of their surface. They are two small islets, and, with their connecting sand bar, are 7 cables in length, parallel to the shore, from which they are distant about half a mile. The eastern or larger islet is $3\frac{1}{2}$ cables long and about 50 feet high. They both present cliffs of sandstone to seaward, and are united to the shore by a long sand-bar at their western extremity. The space between the islets and the shore forms a secure boat harbour, having an entrance from the eastward; but it is all nearly dry at low water. The shallow water does not extend off these islands to the southward beyond 2 cables; but continues from them, across the bay to the eastward as far as Little Sands, a distance of 3 miles. The anchorage to the eastward of the islands, within the distance of a mile, and at any depth from 3 to 9 fathoms, is good in north-west winds, the Indian rocks breaking the sea.

WHITE SANDS.—From Little Sands to White Sands, 6 miles E. by S., the sandstone cliffs are 40 to 50 feet, and quite bold.

White Sands is a settlement, receiving its name from the sandy beach of a small bay, 9 miles eastward from the Wood islands. There is a sand-spit there, just covered at low water, which affords some shelter to boats, and a sandy shoal extending to the distance of half a mile off shore. The edge of this shoal is so steep and the water near it so deep, that the lead gives no warning; but if Blackrock point (the extreme to the eastward) be kept open to the southward of Guernsey point (the west side of Guernsey cove), it will lead to the eastward of the shoal; for those points in one, bearing E. by N. $\frac{1}{2}$ N. lead along its southern edge.

Guernsey and Blackrock points, distant $1\frac{1}{2}$ and 3 miles respectively to the eastward of White Sands, have each large rocks above water close off their cliffs; and so also has Cape Bear, which is 6 cables farther to the eastward; but the rock off the cape is much higher than the others, its summit being about 12 feet above the sea at high water, whilst Blackrock is only 7 feet, and the other still lower.

The shore to the eastward of White Sands is formed of sandstone cliffs, which are in some places 40 feet high, without beach or landing, except at Guernsey cove, and from which the shallow water does not extend beyond $3\frac{1}{2}$ cables until near Cape Bear.

CHAPTER XVIII.

GULF OF ST. LAWRENCE; SOUTH-WEST COAST,—EAST AND NORTH COASTS OF PRINCE EDWARD ISLAND, AND NORTHUMBERLAND STRAIT.

VARIATION 22° to 23½° West in 1860.

CAPE BEAR, the southern point of the east coast of Prince Edward island, will be known by the large rock, 12 feet high, which lies close under its cliffs of red sandstone; and Murray head, a mile farther to the northward, by its forming the extreme north-eastern point of the cliffs, where they turn abruptly to the westward towards Murray harbour.*

Bear reef runs out to the eastward, from between Cape Bear and Murray head, three-quarters of a mile, to the depth of 3 fathoms, and one mile to 5 fathoms; and is composed of sandstone and large stones. There is but little water over the greater part of this extensive and irregularly shaped reef, which has 7 or 8 fathoms close to its edge, and is therefore dangerous to vessels rounding the cape at night or in foggy weather, when they should not approach nearer than the depth of 10 fathoms, either to the eastward or southward of the reef.

There are no close leading marks for passing to the eastward of this reef, but Panmure head and Terras point in one, bearing N. ¼ E., clear it at the distance of one mile in that direction; at night the light on Panmure head must be kept open of Terras point. Guernsey point kept well open to the southward of Blackrock point, will lead to the southward.

WATER.—At the distance of 3½ cables to the southward of Murray head, there is a fine little stream of fresh water, worthy of notice, because because there are so few places on the island where a large ship can readily water. Boats can land there in westerly winds, when vessels will find good anchorage under the head.

FISHERMANS BANK is of sandstone, thinly covered with stones, gravel, and broken shells. Within the depth of 10 fathoms, it is 3 miles long east and west, by 1½ miles broad; but the shallow central part, with from 4 to 5 fathoms at low water, covers scarcely half that space. From the least water, 4 fathoms, Murray head, the nearest land, bears W.N.W. 7½ miles; and there is another patch with 5 fathoms three-quarters of a mile farther east. There are irregular soundings, from 10 to 20

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* *See* Chart:—Gulf of St. Lawrence, Sheet ix., Eastern part of Northumberland Strait, No. 2,034; scale, $m = 0{\cdot}28$ of an inch.

fathoms, between this bank and Bear reef, and in every other direction around it from 15 to 20 fathoms. It is very dangerous to vessels of large draught when there is a heavy sea running, and should not then be approached nearer than the depth of 13 fathoms, which in most parts is close to its 10 fathoms edge, and little more than half a mile from the shallow water. The steeple of the English church at George town, in line with Panmure head, bearing N.N.W. $\frac{1}{2}$ W., would lead over the bank in 5 fathoms; but the church can seldom be seen from the bank, being distant from it 15 miles.

MURRAY HARBOUR has an exceedingly dangerous bar of sand, over which 10 feet can be carried at low water in ordinary spring tides; but strong easterly winds send in so heavy a sea as to render it at times impassable, a line of breakers extending then completely across the bay from Murray head northward to Cody point, a distance of nearly $2\frac{1}{4}$ miles.*

On the outer edge of the bar a *buoy* is moored in 3 fathoms, with the *white* beacon on Old Store point (the sandy south point of entrance) in line with the *black* ball on the white gable of the Transit barn, bearing W. by S. $\frac{1}{3}$ S. The barn stands on the southern shore of the harbour three-quarters of a mile within the entrance, and when in line with the beacon leads in through the deepest water. There is moreover an *inner buoy* in the fair way, half a mile within the outer one, and which is intended to enable vessels to run in when hazy weather prevents the leading mark from being seen.

DIRECTIONS.—Proceeding in from the bar, the channel into Murray harbour, between sandy shoals extending from the shore on either side, contracts gradually in breadth to 120 yards, and expands again to 2 cables within the entrance. The depth also gradually increases after crossing the bar, to 6 fathoms, as the vessel passes close to the steep sandy beach of Old Store point on which the beacon stands.

To run in, look out for the outer buoy, or, being in not less than 5 fathoms, bring the white beacon and the black ball on the white gable of the Transit barn in line, bearing W. by S. $\frac{1}{3}$ S., and keep them so exactly until the vessel arrives between 2 and $1\frac{1}{2}$ cables of the beacon, when haul a little to the northward, so as to pass Old Store point at the distance of about a quarter of a cable, and anchor within, or to the west of it, at any distance not exceeding a quarter of a mile, because farther in, the channel which passes to the southward of all the islands, becomes very intricate, and would be difficult to follow without a pilot. The depth, in the anchorage recommended, is from 3 to 5 fathoms with sand and clay bottom, and a tide of 2 knots.

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* *See* Plan of Murray Harbour, No. 1,973; scale, $m = 4$ inches.

The entrance of Murray harbour, between Old Store point and the long sandy spit which runs out to the south-west from Cody point, is more than half a mile wide, but it is all nearly dry at low water, excepting the channel already described. Within this entrance the harbour is of great extent, containing five wooded islands, and several rivers or sea creeks on either side, besides the main inlet, Murray river, which is much larger than the rest, and navigable to the distance of 6 miles from the entrance, or nearly to the dam which has been constructed across it near its head. There are flourishing settlements all around, the principal one being at South river, where the English church, distinguished by its steeple, will be seen on the southern shore 2 miles within the entrance of the harbour. In the year 1856, 17 vessels, amounting to 472 tons burthen, entered inwards, and 21 vessels, 899 tons, cleared outwards ; the total value of imports was 1,444*l.*, of exports, 2,551*l.*

TIDES.—In Murray harbour, it is high, full and change, at 9h. 6m. ; springs rise $6\frac{1}{4}$ feet, and neaps $3\frac{1}{4}$ feet.

GRAHAM LEDGE.—At $4\frac{1}{2}$ miles, N.N.E. $\frac{1}{4}$ E. from Murray head, is Graham point, from which Graham ledge runs out one mile to the depth of 5 fathoms, and three-quarters of a mile to 3 fathoms. The shallowest part of this ledge, with 6 feet least water, bears E.N.E. 4 cables from the extremity of the point. There is also a rocky shoal one mile farther to the northward, which runs out two-thirds of a mile from between Terras and Smith points, and foul ground with from 4 to 5 fathoms at low water extends off the latter to the distance of $1\frac{1}{2}$ miles. The soundings are very irregular off this part of the coast, between Graham point and Panmure head, varying from 13 fathoms, mud, to $5\frac{1}{2}$ fathoms, rock, until beyond 3 miles from the shore.

GEORGE TOWN HARBOUR, sometimes called Three Rivers, is situated on the south-west side of Cardigan bay, 3 miles within or to the N.W. by N. from Panmure head, which is distant 9 miles to the northward from Cape Bear. It is the finest harbour in the southern part of the Gulf, excepting Charlottetown, having depth of water and space sufficient for the largest ships. The rise of ordinary spring tides being only 5 feet is a great disadvantage as compared with Charlottetown harbour, but, on the other hand, the ice does not, in general, form in it so soon in the fall by several weeks, and also breaks up earlier in the spring, so that vessels can enter it later and leave it earlier, which is an important advantage in a climate where the navigation is closed by ice for so long a portion of each year.

George town, the capital of King's County, is well situated on the northern shore of the harbour, just to the eastward of Gaudin point. Its

streets, wide and at right angles, are scarcely as yet marked out by houses, the population amounting only to 450 in 1844, but it is rapidly increasing. The principal buildings are the two churches (the northern church has a cupola, and the southern church a steeple) and the court house: they are all of wood. In the year 1856, 116 vessels, amounting to 5,662 tons burthen, entered inwards, and 96 vessels, 6,438 tons, cleared outwards; the total value of imports was 20,475*l.*, and of exports 16,359*l.*

Supplies—Almost all kinds of supplies may be obtained at George town, but fresh water in large quantities only from wells, as in most other parts of the island.

The channel leading to the entrance of the harbour passes between the shoals off Panmure island and Cardigan point. A brief description of these shoals, and the objects for avoiding them, will be useful in illustration of the Admiralty chart, and to render the directions intelligible.*

LIGHT.—The light-tower on Panmure head, the east extreme of Panmure island, is a wooden octagon building, 49 feet high, and painted white (*See* View on Chart). It shows at 89 feet above the sea at high water a *fixed white* light, which is visible in clear weather from a distance of 14 miles.

PANMURE ISLAND and LEDGE.—Panmure island is about 2 miles long by 1 mile broad, in great part wooded, and has cliffs of red sandstone 40 feet high along its north-eastern shore. It is joined to the land to the southward by a narrow sand bar always above water, and more than a mile in length. Within this bar is St. Mary bay, and farther westward Sturgeon and Livingstone bays; all three having a common entrance to the north-west of the island, between Panmure spit and the shoal off Grave point, and which, although very narrow, has depth of water sufficient for vessels of large draught.

Panmure ledge, of sandstone, covered by only a few feet of water, runs out 6 cables from Panmure head to the depth of 3 fathoms; and its outer extreme, in 5 fathoms, and three-quarters of a mile off shore, will be just cleared by keeping Graham point and Murray head in one, bearing S.S.W. $\frac{1}{4}$ W.

PANMURE SHOAL and SPIT.—Panmure shoal extends to the distance of two-thirds of a mile off the northern shore of Panmure island; and Panmure spit, which forms the western side of the shoal, and is of sand dry at low water, equally as far to the N.N.W. from Billhook point, the north-west extreme of the island.

A *white* buoy is moored close to the steep northern edge of the shoal,

* *See* Plan of Cardigan Bay, No. 2,029; scale, m = 3 inches.

in $5\frac{1}{2}$ fathoms, with Macdonald house and store, on the west side of the island, just open to the westward of Billhook point, bearing S. by W. $\frac{1}{2}$ W. two-thirds of a mile; and the English church steeple at George town in line with the east side of the Thrumcap, bearing N. by W. $\frac{1}{2}$ W. The Panmure shoal and spit, and farther in the equally steep shoals off Grave and St. Andrew points, form the dangers on the south side of the entrance channel to George Town harbour.

CARDIGAN SHOAL.—The dangers on the north side of entrance to George Town harbour are, the Cardigan shoal, the Knoll, and the Thrumcap shoal. The Cardigan, stretching to the south and east from Cardigan point, which separates Cardigan river from the harbour, is an extensive shoal of sandstone; the least water on it is 4 feet, and it has only 6 feet at low water, three-quarters of a mile out from the shore. At the distance of one cable farther out there are 3 fathoms, and the *red* buoy, moored on its south-east extreme in 5 fathoms, is distant one mile from the low cliffs at the extremity of the point. From this buoy Panmure head (distant $1\frac{1}{4}$ miles) is in one with Terras point, bearing S. $\frac{1}{4}$ W.; and French point is seen over the sandy spit of Aitkins point, and in one with its wooded extreme, bearing N.W. by W. $\frac{1}{2}$ W.

At the distance of one mile W. by N. from the red buoy, and on the south-west extreme of the Cardigan shoal, a *black* buoy is moored in 4 fathoms, with Cardigan point bearing N.N.E. $\frac{3}{4}$ E.; Brudenell islet and Gaudin point touching, and bearing N.W. $\frac{3}{4}$ N.; and the white buoy on the Panmure shoal S.W. $\frac{1}{4}$ W., distant one quarter of a mile. In a direct line from the red to the black buoy of the Cardigan shoal, there is not less than $3\frac{1}{2}$ fathoms, and the southern edge of the shoal in 5 fathoms may be followed by the lead from the one to the other. From the black buoy the western edge of the shoal trends northward to within one cable of the shore, sheltering the outer anchorage, in 5 fathoms mud bottom, between it and the Knoll.

The KNOLL, a small sandy shoal, probably based upon sandstone, and with 9 feet least water, lies just outside the entrance of George Town harbour, and directly in the way of its navigation. To enable vessels to beat in and out with safety a buoy should be placed on its south-west extreme, with the following marks:—Boughton island and Cardigan point touching, and bearing E. $\frac{1}{2}$ N.; Grave and Thornton points in one, S.W. $\frac{1}{2}$ W.; the west side of the Thrumcap N.N.E. $4\frac{1}{4}$ cables; the black buoy on the Cardigan S.E. $\frac{1}{2}$ E. nearly one mile; and the black buoy on the Thrumcap (if properly placed), N.N.W. $3\frac{3}{4}$ cables, and in one with Gaudin point.

THRUMCAP SHOAL runs out from the Thrumcap (which is a small wooded and cliffy islet joined to the eastern point of entrance of George

Town harbour by a sand bar) 3 cables in a W. by S. direction. On its south-west extreme, in 3 fathoms, a *black* buoy is moored with the cupola and the steeple of the churches in George town in one, bearing N. $\frac{3}{4}$ E.; the north-west side of the Thrumcap E. by N., and the beacon at Whiteman's wharf S.W. $\frac{3}{4}$ S. This shoal, which is of sand, and dry at low water nearly all the way out to the buoy, completes the shelter of the harbour, preventing any sea of consequence from rolling in.

The entrance, between the Thrumcap and St. Andrew point on the south-western shore, is two-thirds of a mile wide, but the shoals diminish the breadth of the channel to $2\frac{1}{4}$ cables, and it is still narrower at the Knoll, where it is scarcely 2 cables; whilst farther out still, between the Cardigan and Panmure shoals, it is no more than $2\frac{1}{2}$ cables; considering it to be bounded by the depth of 3 fathoms on each side. Within the Thrumcap the northern shore of the harbour forms a bay three-quarters of a mile wide, the north-west point of which is Gaudin point, having a sandy spit running out from it a quarter of a mile to the S.W. The usual and best anchorage for large vessels, is between this spit and the Thrumcap shoal, in 5 fathoms, mud; but smaller vessels may anchor farther within the bay, and will find $2\frac{3}{4}$ fathoms within the distance of one cable from the wharf at the town.

DIRECTIONS.—From what has been said of the narrowness of some parts of the channel leading into George Town harbour, it will appear manifest that a competent pilot, acquainted with the set of the tides, &c., would be required to beat a large ship in or out, but with a leading wind and fine weather the intelligent seaman will find no difficulty with the aid of the chart and the following brief directions.

Observe that, in addition to the aid afforded by the buoys, there is a beacon at the inner end of Whiteman's wharf on St. Andrew point, which kept in line with the centre of his house, bearing N.W. by W. $\frac{1}{2}$ W., leads in between the Panmure and Cardigan shoals nearly in mid-channel, until Brudenell islet and Doctors point come in one, bearing N.N.W. $\frac{3}{4}$ W.; when the last-named objects kept touching lead into the harbour. Having therefore a fair wind, that is, any wind from S.W., round south and east, to N.E., proceed as follows:—

Approaching from the eastward, pass Boughton point, the south-east extreme of Boughton island, at the distance of one mile; steering W. by N. $\frac{1}{2}$ N., and looking out for the beacon and Whiteman's house, which will be a little on the starboard bow. As soon as the vessel arrives within one mile of Panmure island, bring the beacon and house in one, and steer for them N.W. by W. $\frac{1}{2}$ W., or as may be necessary to keep them so. When Panmure head and Terras point come in one, the red buoy on the

Cardigan shoal should be seen bearing N. $\frac{1}{4}$ E., and distant half a mile, and the vessel should be in 7 or 8 fathoms water. At the same time, the black buoy on the Cardigan and white buoy on the Panmure shoal should be seen on her starboard and port bows respectively, and at the distance of one mile.

Continue to run towards the beacon and house exactly in line (passing between the last named buoys), until the vessel has approached within half a mile of the beacon, when Brudenell islet and Doctors point will be seen (up Brudenell river to the north-west of the town), touching and bearing N.N.W. $\frac{3}{4}$ W. If the Thrumcap buoy can now be seen, which should bear N. by W. $\frac{1}{3}$ W. two-thirds of a mile, steer so as to give it a berth of one cable in passing to the south-west of it into the harbour ; but, if the buoy be not seen, run towards Brudenell islet and Doctors point touching until the cupola of the northern church is seen well to the north-west of the steeple of the southern church, or until the latter bears not less to the eastward than N. by E. $\frac{1}{2}$ E., when haul towards it, and choose a berth in from 6 to 3 fathoms over mud bottom.

Approaching the harbour from the southward, round Panmure ledge by the lead in 7 fathoms, or by keeping Murray head open to the eastward of Graham point till the north side of Panmure island bears as far to the westward as N.W. by W. $\frac{1}{2}$ W., when the vessel may haul in to the north-westward, following the northern edge of the Panmure shoal until the beacon and house can be made out, and brought in one, as before directed. If it should so happen that, from thick weather, or other cause, the beacon and house cannot be seen, the northern edge of the Panmure shoal may safely be followed by the lead, in 6 fathoms, to within half a mile of the white buoy, when the shoal becomes too steep to be safely followed farther. In like manner the southern edge of the Cardigan shoal may be followed, from the red buoy to the black buoy on its south-west extreme, as already remarked ; and the vessel may either bring up, in the outer anchorage, half a mile within the latter in a line towards the Thrumcap, or proceed into the harbour, as may be expedient. Between the Gaudin spit and Aitkins point, the channel of the harbour is only $1\frac{3}{4}$ cables wide, from the depth of 3 fathoms to 3 fathoms, and carries $6\frac{1}{2}$ fathoms water ; but it expands again immediately, affording excellent anchorage all the way to Brudenell point, one mile above the town.

TIDES.—It is high water, full and change, in George Town harbour at 8h. 40m., by the mean of the morning and evening tides ; the latter being generally the latest by about an hour in the summer months. The rise is 5 feet in spring, and $3\frac{1}{4}$ feet in neap tides. The rate of the tidal streams does not exceed three-quarters of a knot.

BRUDENELL and MONTAGUE RIVERS, which unite their streams at Brudenell point, to the westward of George Town harbour, require only a brief notice. The former, the northernmost of the two, is navigable for large vessels to Brudenell islet, $1\frac{1}{4}$ miles up, and for small craft and boats about 3 miles farther, to the head of the tide. Vessels of considerable burthen can ascend the Montague nearly to the bridge, a distance of 4 miles, and boats about a mile farther to where the tide ends. The fresh-water streams at the heads of these sea creeks are mere brooks.

CARDIGAN RIVER, which with the other two just noticed has occasioned George town and harbour to be called Three Rivers, is much the largest of the three, being navigable for the largest ships to the distance of 5 miles above Cardigan point; and smaller vessels can ascend it 2 miles farther, or to within half a mile of the head of the tide, where the fresh water is insignificant in quantity. This river, which enters Cardigan bay on the north-east side of Cardigan point, is rendered somewhat difficult of entrance by the Macphee shoal and the Maitland flat, which are very steep, and contract the navigable channel to 2 cables in breadth, the depth being 7 fathoms.

There are no sufficient natural marks for clearing these dangers, and therefore buoys or beacons would be required if ever the river be resorted to by large vessels; at present an occasional new ship, and a few small coasting schooners, are all that are ever seen there.

CARDIGAN BAY, in which the harbour and rivers last described are situated, is $3\frac{1}{4}$ miles wide at its entrance between Panmure and Boughton islands. It affords excellent anchorage in from 6 to 10 fathoms, mud bottom, with winds off shore, but winds from E.N.E., round east and south, to S.W. by S., send in a heavy sea.

BOUGHTON ISLAND, not quite so large as Panmure island (page 106), is united on the north-east side to Bruce point by a dry sand bar one mile in length, and is divided into two parts, of which the southern, one-third of a mile long, is joined to the remainder by a double bar of sand and shingle inclosing a large pond. Boughton ledge runs out at this bar to the distance of 6 cables to the eastward, and has rocks near its outer extreme, which always show. Boughton point, the south extreme of the island, is a cliff of red sandstone 30 feet high, and has a rock which dries off it, and shallow water to the distance of half a mile. Rocky and irregular soundings, 4 to 5 fathoms, run out to the E.S.E. still farther, and therefore a vessel of large draught, at night or in thick weather, should not round the point in a less depth than 9 or 8 fathoms.

Off the west side of the island, a bank, with from 3 to 5 fathoms, ex-

tends to the distance of $1\frac{1}{4}$ miles; and farther to the westward there are dangerous shoals; which together with the Boughton spit, and the Mosquito sands, extend along the north-east shore of the bay nearly to Maitland point at the entrance of the Cardigan. There are narrow and intricate channels between these shoals, and the land to the northward, which lead into Launching bay. Large ships should not stand into less than 5 fathoms at low water on this side of the bay.

Off Boughton sand bar and Bruce point the shallow water extends two-thirds of a mile, and in Boughton bay the line of 3 fathoms is a mile out from the shore.

BOUGHTON or GRAND RIVER, 5 miles N. N. E. from Boughton point, has a dangerous bar of sand one mile out from its entrance, and over which 6 feet, at low water ordinary spring tides, can be carried in a very narrow channel marked out by three *buoys*. The outer buoy is moored in 3 fathoms, the next in 2 fathoms, and the inner one in 11 feet; the bar of 6 feet being between the two last. At a short distance within the inner buoy, the sands on each side are dry at low water, and the channel can generally be seen all the remainder of the way to the entrance, where it passes close round the northern point of the long sand bar which stretches across from the southern shore, to within $1\frac{3}{4}$ cables of Banks point, where there is a wharf and ferry.*

Immediately within the entrance the inlet is a mile wide, but the channel is divided, narrow, and intricate, and marked out by stakes between sandy shoals for about one mile; after which it is clear, wide, and has from 3 to 5 fathoms water in it, to the Narrows, 3 miles from the entrance. Boats can ascend 3 miles farther, or to the bridge. There are flourishing settlements on each side of this extensive inlet, which if it were not for the shallow bar would be a fine harbour.

TIDES.—It is high water, full and change, at the Ferry wharf, Boughton river, at 8h. 4m.; spring tides rise $4\frac{3}{4}$ feet, and neaps $2\frac{3}{4}$ feet. The rate of the tides in the entrance is 2 knots.

LITTLE RIVER, FORTUNE RIVER, ROLLO BAY, and COLVILLE BAY and RIVER, occurring in order in proceeding along the coast to the north-east, are tide inlets nearly barred up with sand, and having small streams at their heads; they are places only fit for small craft and boats, having from 3 to 5 feet over their bars at low water.

Colville river, situated in Colville bay between Souris head and Swanton point, and distant 12 miles N.E. of Boughton point, is the most important, being the place where the produce of the more eastern parts of the island

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* *See* Plan of Boughton or Grand River, No. 2,005; scale, $m = 4$ inches.

is principally shipped. Colville bay affords good anchorage with off-shore winds, and the settlement of Souris, and the church, will be seen on its eastern shore.

Sharp cliffy headlands and points of red sandstone separate the bays in which these rivers are situated, the cliffs being from 25 to 50 feet high, and the shallow water off them not extending beyond the distance of 3 cables, excepting at Eglington point (separating Fortune bay from Eglington cove), where the reef is very shallow for the first 4 cables out from the shore, and continues 6 cables farther with from 3 to $4\frac{1}{4}$ fathoms over rocky bottom; but this is within the line joining Howe point and Souris head, and therefore out of the way of vessels running along the coast.

The COAST to the eastward of Colville' bay is bold and free from danger, excepting Harvey reef, which extends 4 cables from Harvey point, and has on it the Shallop rock, which always shows. Harvey point is 5 miles from Colville bay, and will be known by its being the eastern point of Harvey cove, in which there are some remarkable and high sand hills. At Basin head, one mile farther to the eastward, the cliffs terminate, and sand hills and sandy beach form the shore nearly all the way to East point, a distance of nearly 9 miles. In this distance the East lake is all that requires notice. It is a shallow and narrow pond, within the sand bars, extending from Basin head to within 2 miles of East point, and having a narrow outlet (2 miles from the head), which is nearly dry at times at low water. Boats and small craft enter it for produce, the country being well settled along its northern shore.

TIDES.—It is high water, full and change, at East lake at $8\frac{1}{2}$h., and the rise is $3\frac{3}{4}$ feet in spring, and $2\frac{1}{3}$ feet in neap tides.

EAST POINT.—The eastern point of Prince Edward island is a cliff of red sandstone from 30 to 60 feet high, from which a reef runs out two-thirds of a mile to the depth of 3 fathoms, and not quite a mile to 5 fathoms. In vessels approaching this reef at night, it should be remembered that the flood tide comes from the northward, setting strongly upon and over it, and afterwards south-westward, between it and the Milne bank, at the rate of $2\frac{1}{2}$ knots. There is frequently a great rippling off the point, but the reef does not extend farther than has been stated. The depth of 20 fathoms is as near as a vessel of large draught should approach when the land cannot be seen at night or in foggy weather.

ANCHORAGE.—The anchorage is not good to the northward of East point, the ground being either loose or rocky; but to the southward of it there is good riding with northerly winds as far westward as the East lake outlet, in a moderate depth of water, and over a bottom of red sand.

The tides run at the rate of $2\frac{1}{2}$ knots between the north end of Milne bank and the point, but are not nearly so strong farther to the westward.

MILNE BANK, if considered to be bounded by the depth of 10 fathoms, is $5\frac{3}{4}$ miles long, N.N.E. and S.S.W., and $1\frac{3}{4}$ miles broad; the bottom being of sandstone thinly covered here and there with red sand. The soundings are irregular, between 6 and 9 fathoms, over the northern part of the bank; but towards the southern end, and close to the outer edge, there is a shallower part, $1\frac{1}{2}$ miles in length, on which there are less than 5 fathoms; and it is here that the least depth is found, namely, $4\frac{1}{2}$ fathoms at low water, in spring tides. This shallowest part of the bank lies between S. by E. and South from East point, and is distant from it $4\frac{1}{4}$ to $5\frac{3}{4}$ miles. Souris head and Dean point in one, bearing W. by N., pass over its north extreme in 5 fathoms; and Swanton and Chepstow points, bearing W. by N. $\frac{1}{2}$ N., just lead to the southward of it in the same depth, but those points are so distant that fine weather, and a person well acquainted with the coast, would be required to distinguish them.

The extreme south end of this bank in 10 fathoms, bears South $6\frac{1}{4}$ miles from East point; and the north extreme E.S.E. 2 miles. Between the northern part of the bank and East point there are from 10 to $11\frac{1}{2}$ fathoms, red sand bottom, the deepest water being close to the bank. The eastern or outer edge of the bank is steep to, there being from 12 to 15 fathoms close to it, and there is frequently a great rippling along it, caused by the abrupt opposition which it presents to the flood tide from the north-east. The sea is very heavy here, and also off the point, in strong north-east gales.

NORTH COAST of PRINCE EDWARD ISLAND.—The great bay formed by the northern coast of Prince Edward island, and the difficulty of beating a ship out of it in heavy and long-continued north-east gales has been already mentioned (page 82). That difficulty seems to be caused by an acceleration in the rate of the current so frequently found running past Cape Gaspé, Bonaventure island, and the Miscou banks, and which doubtless continues farther south; or it may arise from an extension of that general set to the southward so often experienced by vessels crossing from the Bird islands towards Anticosti or Cape Rosier (page 23, vol. I.), and which has been observed to be increased by strong north-east winds; as might have been inferred from the great rise of water which they cause in all the southern ports of the Gulf.

The set of the tidal streams may also at times be very unfavourable to a vessel under the supposed circumstances, for the stream of flood is known to set to the southward into the bay, in conformity with the progress of the reflux tide wave, from North point south-eastward to

St. Peters, whilst farther eastward the tide which comes from the north-east, from between the Magdalen islands and Cape Breton, also sets towards the shore, especially near East point.

The reflux course of the tide wave on this coast has been inferred from observations made during the Admiralty surveys of all the harbours; from which it appears, that the time of high water on the full and change days becomes later in succession, in proceeding south-eastward from North point to Cascumpeque, Malpeque, Grenville bay, Rustico, Tracadie, and St. Peters. At St. Peters, the time of high water, full and change, namely, $8\frac{2}{3}$ hours, is rather later than at East point, and as there is also a considerable increase in the rise of the tide, there seems reason to conclude that the two tide waves meet somewhere about this harbour, the western being twelve hours older than the eastern wave.

With the exception of a few places off the bars of the harbours, the anchorage is, generally speaking, very bad all along the northern shore of the island; the bottom being of red sandstone, thinly covered occasionally with sand, gravel, and broken shells.

The harbours are all of the same character, having narrow entrances between sand-bars, with dangerous bars of sand at various distances from the shore. They are only fit for small vessels, with the exception of Richmond bay and Cascumpeque, and even those could not be safely run for in bad weather, and with a heavy sea running, at which times the breakers on their bars extend quite across, leaving no visible channel. New vessels are built in these harbours almost every year, the smaller for the Newfoundland trade; and besides the coasting schooners for produce, American fishing schooners frequently call at them for wood and water, or shelter on the approach of bad weather.

The following remarks, which will embrace all that appears useful to the seaman along this coast, will commence from the north point of the island, which, with its dangerous reef, has been described in page 83.

TIGNISH RIVER.—From the north point of Prince Edward island to Cape Kildare, 11 miles to the S. by W. $\frac{1}{2}$ W., there is little requiring notice, excepting the river Tignish, with only 2 feet water in its narrow sandy entrance at low tide, and affording shelter to fishing boats; and where also there is a church and settlement, principally of Acadians. About a mile to the northward of the entrance a rocky ledge runs off to the distance of $1\frac{1}{3}$ miles, with no more than 3 fathoms on it at low water.

The shallow water extends to the same distance off Cape Kildare, which is a cliff of sandstone 30 feet high; and generally, it must be borne in mind, that there are rocky and irregular soundings, between 3 and 5 fathoms, all along this part of the coast, frequently extending nearly 2 miles off shore.

CASCUMPEQUE HARBOUR, sometimes called Holland harbour, is distant 5 miles S·W. $\frac{1}{2}$ W. from Cape Kildare, and at the bottom of the bay where the land begins to trend to the eastward. It will be known also by the remarkable high sand hills, $3\frac{1}{2}$ miles to the southward of its entrance; these are the remains of a range of sand hills formerly known as the Seven Sisters, and are 50 feet high. There are no high sand hills to the northward of the harbour.*

The entrance to this harbour is $1\frac{3}{4}$ cables wide, between two sand bars resting upon the sandstone which forms the Inner bar, over which there are 10 feet at low water. The Outer bar, of sand, lies $1\frac{1}{4}$ miles out from the entrance, and has the same depth, namely 10 feet at low water, in a very narrow channel indicated by a *buoy*, which vessels must pass close to the southward of, and also by a *white beacon* (on the south extreme of the northern sand bar), in one with a *white mark* on a log hut, bearing W. by N.

The channel, from the one bar to the other, and between sand, covered by only a few feet of water, is a cable wide, and affords tolerable anchorage in from $2\frac{1}{2}$ to $3\frac{1}{2}$ fathoms sand bottom; the best berth being just outside the entrance, where the sands on each side dry at low water. It was here that vessels used to lie to complete their cargoes, after loading in the harbour to the draught that could pass out over the Inner bar; there being at that time much more water on the Outer bar; 18 feet, it is said, at high water. The diminution of depth has taken place within the memory of persons now living, and is attributed to the opening of a second entrance into the bay; the breach in the sand bar, which was at first effected by the sea during a heavy north-east gale, having been increasing ever since. This newer entrance into the bay, which has, at present, 5 feet over its bar, is about 2 miles to the southward of the harbour, for which its nearness to the high sand hills, and there being no beacon or lighthouse, will prevent its being mistaken.

LIGHT.—The lighthouse in Cascumpeque harbour stands on the north side of the entrance, near to, but higher up on the sand bar than the beacon. It is a small wooden, octagonal tower, coloured white, and exhibits at 32 feet above high water a *fixed white* light, visible in clear weather at 8 miles.

TIDES.—It is high water, full and change, at the beacon in Cascumpeque harbour, at 5h. 40m.; and the rise in ordinary springs is 3 feet, and in neaps 2 feet; but this is not regular, and therefore 12 feet over the bar at high water is all that can be safely reckoned upon on any

* *See* Plan of Cascumpeque Harbour, No. 2,027; scale, $m = 2{\cdot}3$ inches.

particular day; unless in strong easterly winds, which cause a rise of a foot or more in all the harbours of this coast.

It must also be observed, that the rise given is always that of the best tide in the 24 hours; and that the morning spring tides are the highest during the summer months. It frequently happens at or near the springs, that the evening tides rise only a few inches, and sometimes they entirely disappear, causing single day tides for a short time, as at Richibucto and Shediac (pages 46, 52).

The morning spring tides are also the earliest during the summer months, as, for instance, at Cascumpeque beacon at the full and change, in July, when the morning high water occurred at 4h. 22m., and the evening tide at 6h. 58m.; the mean being 5h. 40m.; as given above and in all other similar cases.

At or near the neaps, the two tides of the same day become nearly equal in time and rise for a short time. There is reason to believe that the diurnal inequality of the tides ceases for a time soon after the equinox, and that it is reversed in winter, but the ice has hitherto prevented observations during that season. These remarks apply to all the harbours of this island, and of the neighbouring provinces: their importance to vessels seeking refuge and taking the dangerous bars in bad weather will be evident. The rate of the tidal streams in the entrance of Cascumpeque harbour is in general $1\frac{1}{2}$ knots, and it seldom, if ever, exceeds 2 knots.

DIRECTIONS.—As the bar of Cascumpeque harbour may shift in the course of years, a pilot would be indispensable to a stranger visiting it for the first time. The only observation, therefore, that will be made is that (at the time of the survey), the white mark on the hut should not be opened in the least to the northward of the beacon, since those objects in one led in close along the southern edge of the northern sand. In strong easterly gales the bar is covered with a continuous line of heavy breakers.

There is good anchorage off the bar in fine weather in 5 or 6 fathoms, sand bottom. Within the entrance, the harbour has plenty of water, and a clear channel, which, after running in one mile to the westward, turns to the southward within Savage island, and between it and Hill point, where there is a wharf at which vessels generally load.

CASCUMPEQUE BAY is of great extent, and broken into inlets or rivers which penetrate the country in a variety of directions, and to the distance of many miles. The Admiralty chart must be referred to for these, and also for the boat communications within the sand bars, when the tide is in, northward to Kildare river, and southward to Richmond bay. The principal entrance of Richmond bay, leading into Malpeque

harbour, bears S.S.E. $\frac{1}{2}$ E., 20 miles from Cascumpeque, the intervening shore being formed exclusively of sand bars and sand beaches, from which the shallow water extends two-thirds of a mile to 3 fathoms, and one mile to 5 fathoms. In the above named distance there are two openings through the sand bars, Cavendish and Conway inlets, which afford shelter to boats, and are distant 7 miles and 11 miles respectively, from the light-house at Cascumpeque.

Boats can enter Richmond bay by the last named inlet, passing to the westward of Lennox island at high water.

RICHMOND BAY is of great extent, running in 10 miles to the south-west, and crossing the island to within $2\frac{1}{2}$ miles of the waters of Bedeque harbour. It contains seven islands, and a great number of creeks or rivers, some of which are navigable for vessels of considerable burthen, and all of them by small craft and boats. Grand river, which is the principal inlet, can be ascended in boats to the bridge, a distance of 7 or 8 miles.*

There are fine settlements at Grand river, and also at Port Hill, in the north-west part of the bay within Lennox island, and where several vessels load every year. There is an Indian church and settlement on Lennox island, but it cannot be seen from the sea. There are also large settlements at the head of the bay, where the churches of St. Eleanor and Miscouche are seen on the ridge which separates its waters from those of the Strait of Northumberland.

Malpeque, which has given its name to the harbour, is one of the oldest settlements on the island, and, with its church, stands on the neck of land between Darnley inlet and March Water, $2\frac{1}{2}$ miles South from the entrance of the bay. A competent pilot, or a chart on a large scale, could alone enable any one to navigate a ship through the various channels and inlets of this bay; the following remarks and directions will, therefore, be confined to the principal harbour in its entrance.

MALPEQUE HARBOUR, which is within the eastern entrance of Richmond bay, is superior to any other on the northern coast of the island, having 16 feet over its bar at low water, and from 18 to 19 at high water in ordinary spring tides, together with depth and space enough within for any description and number of vessels. In the year 1856, 15 vessels, amounting to 1,547 tons burthen, entered inwards, and 26 vessels, 3,145 tons burthen, cleared outwards; the total value of imports was 6,770*l.*, of exports 5,721*l.*

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* *See* Plan of Richmond Bay, No. 1,983; scale, m = 2·3 inches.

The principal entrance to the harbour is to the southward of Billhook or Fishery island, and between it and Royalty sand, which dries out a long half mile from Royalty point. The ground is good, in the usual anchorage, just within this entrance; the bar outside preventing any sea from coming in, and the Horse Shoe shoals sheltering them from westerly winds down the bay. The other entrance, to the north-west of Billhook island, is called the West Gully, and is so narrow and intricate as to be only fit for boats, or very small craft, although it has a depth of 9 feet over its dangerous bar of sand, which is $1\frac{1}{4}$ miles out from the shore. There will be no probability of this being mistaken for the main entrance, even if the beacons and buoys were gone, if it be remembered that the Main or Ship channel is to the south-east of all the sand bars, including Billhook island, and between them and the red sandstone cliffs of Cape Aylesbury the south-east point of the bay.

Supplies.—Abundance of fresh provisions may be obtained at Malpeque, but water can only be procured from wells, so that it requires considerable time and labour to supply a ship for a voyage.

LIGHT.—A *fixed white* light, said to be visible in clear weather at 8 miles, is exhibited, at 20 feet above high water, from a large lantern on a pole, on the southern part of Billhook island, on the south side of entrance to Malpeque harbour.

The BAR of Malpeque harbour runs out E. by S. $2\frac{1}{4}$ miles from Billhook island, and then turns to the southward so as to join the shore to the eastward of Cape Aylesbury. It is of sand thinly and irregularly spread upon sandstone; the rock being in many places quite bare. It is exceedingly dangerous in bad weather, when all signs of a channel are obliterated by heavy breakers. The northern part of the bar, to the distance of $1\frac{1}{2}$ miles out to the eastward from Billhook island, is very shallow, there being in some places only 4 feet at low water; but the extent of this shallow part is well shown by a good cross mark, namely, the church at Malpeque, and Darnley point in line, bearing S.W. by S. To the eastward of this cross mark, and to the northward of the line of the beacons, there is more than 12 feet at low water.

The narrowest part of the Ship channel is just within, or to the westward of the above named cross mark, and is one cable wide, and carries 4 fathoms water. The Inner bar, of sandstone and with 19 feet at low water, is a quarter of a mile farther in, and has in general a buoy upon it. Two *white beacons* on the south-east end of Billhook island, kept in one, bearing W. by N. $\frac{1}{4}$ N., will lead through the Narrows of the Ship channel and over the Inner bar; but not over the Outer bar in more than 13 feet at low water. To enable vessels to cross the Outer bar in the deepest

water, namely, 16 feet at low water in ordinary spring tides, the Outer *buoy* is moored in $3\frac{1}{4}$ fathoms, and at the distance of one cable to the northward of the line of the beacons: the intention being, that a vessel by running from the outer to the inner buoy should carry the deepest water; but not more than 15 feet could be insured in that way, or without the assistance of a third buoy between the other two; and therefore a stranger without an experienced pilot should not reckon upon more than that depth.

DIRECTIONS.—As the buoys are liable to drift from their positions, the following directions will be given irrespective of them:—

Being off the bar of Malpeque harbour, in 5 fathoms water, bring the beacons in one, bearing W. by N. $\frac{1}{4}$ N.; then sheer to the northward of their line to the distance of one or two cables, and the westernmost beacon will appear a little to the northward of the other. Steer now so as to make a direct course towards the beacons, keeping the westernmost beacon open a little to the northward, and the vessel will pass the bar in not less than 15 feet, and probably in 16 feet at low water in ordinary spring tides, or a corresponding depth at other times of tide.

The water will deepen immediately within the bar to 18 feet or more, and as soon as it does so sheer at once to the southward, and bring the beacons exactly in one; taking care that this be done before the church at Malpeque opens out to the westward of Darnley point; for if not the vessel will be on shore on the shallow part of the bar on the north side of the channel. Keep now the beacons in one, running towards them, and they will lead through the Narrows, and over the Inner bar in 19 feet at low water; after which they may either still be kept in one, or the westernmost one a little open to the southward of the other, until the vessel is half a mile within the Inner bar, or within three-quarters of a mile of the beacons; when the course must be changed to West, and the sandy south point of Billhook island must be passed at the distance of one cable steering that course into the harbour.* The vessel should anchor with the beacons bearing between E. by N., and E.N.E., and distant from a quarter to three-quarters of a mile, but not farther for fear

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* Grover island, being distant 5 miles from the bar, can with difficulty be distinguished from Bunbury island behind it; but those who can be certain of not mistaking the one island for the other may proceed as follows:—Being off the bar, in 5 fathoms, open the north point of Grover island a little (not more than 2 degrees), to the northward of Royalty point, bearing W. by S.; and keep it so running towards it, until the beacons come in one, when steer towards the latter, keeping them in one, and they will lead in through the Narrows and over the Inner bar; then proceed as already directed.

of the Horse Shoe sands, which commence at the distance of one mile from the beacons. There is less sea farther to the south-west, within or to the westward of the Royalty sand, but a stranger will have less difficulty and risk in taking up the berth first recommended.

The channel passes to the southward of the Horse Shoe sands and between them and Grover island, but, the principal object aimed at in these directions being to enable a vessel to run into a place of safety, the mariner must refer to the chart for the navigation within the bay. Vessels may anchor outside the bar, in from 5 to 7 fathoms, sand bottom, to wait for a pilot; and in the event of the wind or tide failing, the anchorage is considered tolerably safe between the Inner bar and the entrance, and probably is so with any wind that would prevent a vessel from running in, but the holding ground is not good there, and should only be trusted in fine summer weather. Within the harbour the bottom is of sand and clay, and a vessel may choose any depth from 3 to 10 fathoms, the deepest water being close off the point of the Royalty sand.

TIDES.—It is high water, full and change, in Malpeque harbour, at 6h.; the rise being 3 feet in spring, and 2 feet in neap tides: but the rise is so irregular, that it would not be safe to count upon a rise of more than 2 feet on any particular day. North-east winds cause high tides, westerly winds produce the contrary effect. The morning tides are the highest during the summer months (page 116). The rate of the tides is strongest in the entrance, and off the point of the Royalty sand, running in spring tides $2\frac{1}{2}$ knots. In the Ship channel, from the entrance to the Bar, the rate is $1\frac{1}{2}$ to 2 knots. Within the bay the tides are in general much weaker, seldom amounting to one knot.

CAPE TRYON, distant 7 miles, S.E. $\frac{1}{2}$ E., from Cape Aylesbury, is a remarkable cliff of red sandstone, 110 feet high. The coast between Richmond bay and Cape Tryon is nearly straight, and free from detached dangers; but the shallow water runs out a considerable distance, and a large ship should not approach nearer than the depth of 7 fathoms.

GRENVILLE HARBOUR, $1\frac{1}{2}$ miles, S.S.E., from Cape Tryon, has its entrance at the north-western extremity of a long range of sand-hills, the highest of which is 55 feet above high-water mark. The entrance of this harbour is one-third of a mile wide, and carries 3 fathoms water, but it is nevertheless only fit for small vessels, in consequence of its dangerous and shifting bar of sand, over which, at the time of the survey, only 5 feet at low water could be carried in a very narrow channel indicated by two buoys. The bar extends out to the distance of two-thirds of a mile from the entrance, and the shallow water one mile, at which distance there are 5 fathoms over sandy bottom.

Within the entrance the harbour is 3 miles wide, branching into two principal and many smaller creeks, with small brooks at their heads. The two principal of these, namely Stanley and Mill rivers, are navigable for small craft and boats to the head of the tide, a distance of 6 or 7 miles. There are increasing settlements and a fertile country around the harbour, the principal settlement being New London, where the English and Scotch churches are situated on the western shore $1\frac{1}{2}$ miles within the entrance; the former being distinguished by its steeple.

TIDES.—In Grenville harbour it is high water, full and change, at 6h. 10m. by the mean of the morning and evening tides; the morning tide being the earliest and highest during the summer months (page 116). Ordinary spring tides rise only $3\frac{1}{2}$ feet, and neap tides only 2 feet, unless increased by easterly winds.

CAPE TURNER is the highest cliff on the island, being of red sandstone and conglomerate, 120 feet high. It is distant $8\frac{1}{2}$ miles, S.E. $\frac{1}{2}$ E. from Cape Tryon, Grenville harbour lying between.

GRAND RUSTICO HARBOUR has two narrow sandy entrances, on either side of M'Auslin island, and which are distant 3 and 5 miles respectively to the south-east of Cape Turner. Although vessels of two or three hundred tons are occasionally built here, and floated light over the bars in fine weather, yet it is a place only fit for small schooners; for its shifting bars of sand are exceedingly dangerous, having a varying depth of from 4 to 6 feet, and extending out three-quarters of a mile from the shore; at which distance there are 3 fathoms at low water. The line of deepest water over each of these bars is pointed out by two buoys, the positions of which are changed as occasion requires.

Hunter and Whitley rivers, navigable for boats to the distance of 5 miles inland, with Winter creek between them, run into this shallow place, which extends 5 miles along the coast within the sand bars of M'Auslin island and Brackley point, which latter separates it from Little Rustico.

There are extensive settlements here of Acadians and others. The two churches on the western side of Winter creek will be recognized by their steeples. There is also a small chapel at the settlement of New Glasgow, on the western side of Hunter river, but it cannot be distinguished from the sea. These buildings are all of wood.

TIDES.—In Grand Rustico harbour it is high water, full and change, at 6h. 40m.; the rise in ordinary spring tides being $3\frac{1}{2}$ feet, and in neap tides 2 feet (page 116). The rate of the tide streams in the entrances is 2 knots.

LITTLE RUSTICO HARBOUR has its narrow sandy entrance on the western side of Stanhope point, with a depth of only 2 feet over its shifting bar: it is therefore only fit for boats or very small vessels, the rise of tide being the same as at Grand Rustico. This shallow place extends for several miles within the sand bars, and is divided by Black point into Petersham and Stanhope coves, which have small brooks at their heads and are navigable for boats to the distance of 3 miles inland.

CAPE STANHOPE, on which there is a sand-hill 30 feet high, half a mile to the eastward of the entrance of Little Rustico, and 9 miles to the south-east from Cape Turner, has a dangerous reef running out from it three-quarters of a mile to the depth of 3 fathoms, and one mile to 5 fathoms. On some parts of this reef there is only one foot of water, at the distance of half a mile from the shore. Between Cape Stanhope and Cape Turner the coast forms a curve or bay, in which are situated the entrances of the Rustico harbours already described; and where the 3 fathoms edge of the shallow water is seldom less than three-quarters of a mile off shore. Farther out the holding ground is bad, being of red sandstone, with an occasional thin covering of sand.

TRACADIE HARBOUR, or Bedford bay, is distant 4 miles from Cape Stanhope, and 13 miles, S.E. by E., from Cape Turner. Its entrance is at the western extremity of a remarkable range of sand hills 50 or 60 feet high. The bar of sand, which shifts occasionally in heavy gales, extends out to the distance of three-quarters of a mile from the entrance, and has a varying depth of from 5 to 9 feet over it at low water, in a channel only 80 yards wide at the time of the survey. The place therefore is only fit for small vessels, and even they require the assistance of buoys, and favourable weather to take the bar with safety. The harbour is 3 miles wide within the sand-bar, and carries $2\frac{1}{2}$ fathoms water; it sends off a branch to the westward called Winter cove, and runs in 4 or 5 miles to the southward, approaching at its head to within $1\frac{1}{2}$ miles of the Hillsborough river, to which there is a good road across.

TIDES.—It is high water, full and change, at the entrance of Tracadie harbour, at 7h., and the rise varies from 4 to 2 feet, according as it may be spring or neap tides, and also according to the direction of the winds (page 116). The rate of the tide streams in the entrance is about 2 knots.

SAVAGE HARBOUR, at 9 miles to the eastward of Tracadie, has only 2 feet at low water over its bar, and is therefore only fit for boats or very small craft. Just to the westward of its entrance there is some comparatively shallow water, $4\frac{1}{4}$ fathoms over rocky bottom, at the distance of a long mile from the shore. The distance across from the head of this har-

bour (which runs inland 3 miles), to the head of the Hillsborough river is less than a mile, and there is a road across.

ST. PETERS HARBOUR, generally called St. Peters bay, is 3 miles farther to the eastward, and of great extent; running in 7 miles to the S.E. by E., with a depth in some parts of 3 fathoms; nevertheless it forms a harbour only for small vessels, there being only 5 feet at low water over its bar of sand; the outer edge of which, in 3 fathoms, is distant two-thirds of a mile from the shore. The channel through the bar, in which this depth of 5 feet at low water could be carried at the time of the survey, is indicated by two buoys: it is liable to shift in heavy gales, and there is a sharp turn to the eastward immediately within the entrance; so that altogether it is a very dangerous place for a stranger to attempt, or indeed for any one excepting in fine weather.

The Morrell river enters this harbour on the south-west side 3 miles in from the entrance, and is navigable for boats to the same distance inland, where the piles which steady the floating bridge prevent farther ascent. There are several smaller streams on the same side of the harbour, and at its head St. Peters river, which, like the rest, becomes a mere brook at the head of the tide.

The shores of the harbour are well settled, and there is a church on the eastern shore near its head. Its position will be recognized by its magnificent range of sand hills, which, near the entrance, attain the elevation of 70 feet above the sea, and continue for several miles to the eastward; after which there are no more high sand hills till we arrive at Surveyor inlet, within 4 miles of East point.

TIDES.—It is high water, full and change, in Savage and St. Peters harbours, at about 8h. 30m.; and the rise is from 4 to 2 feet, according as it may be spring or neap tides (page 116). The rate of the tide streams in the narrow entrance to St. Peters harbour is nearly 3 knots.

The COAST from St. Peters harbour to East point, a distance of 33 miles E.S.E., is unbroken, formed of red sandstone cliffs, with occasional patches of sandy beach at the mouths of small streams, where boats can land only in fine weather or off shore winds. Surveyor inlet will not now admit a boat, being closed with sand.

The shallow water does not extend beyond half a mile anywhere off this division of the coast, and there are in general 10 fathoms water within one mile of the shore; the bottom being of sandstone, and the anchorage bad in consequence.

NORTHUMBERLAND STRAIT.

A full description of Prince Edward island, and of the opposite coasts of New Brunswick and Nova Scotia, having been given in this and the three preceding chapters, it now only remains to offer a few general remarks respecting the Strait of Northumberland, which appears to have been hitherto avoided by large ships as much from a want of that precise knowledge which a good chart and directions are calculated to convey, as from any supposed amount of danger or difficulty in its navigation. There are, however, few places in which such precision of knowledge is more requisite than in this Strait, which presents a confined navigation 160 miles in length; and which, at Cape Tormentine, the narrowest part, is but 7 miles wide from shore to shore; and only $5\frac{1}{2}$ miles wide, if only the navigable breadth is reckoned between the shoals.*

The description of the dangers and of the soundings have been made very full in consequence; and the times of high water, and the rise of the tides in the various harbours, together with the strength of the tidal streams in their entrances, have also been given; but the tides of the Strait are so peculiar that it will be both interesting and useful to add a general view of the course of the tide waves, and of the strength and direction of the streams which they occasion.

To this will be added briefly the mode of proceeding recommended to be adopted in a vessel running through the Strait in a dark night or in thick weather when the soundings alone can safely guide her.

TIDAL STREAMS.—For the purpose above stated, it will be convenient to divide the Strait at Cape Tormentine into two nearly equal portions, distinguished by the different set of their tidal streams, and by different tide waves, which, advancing from opposite directions, meet in the central part of the Strait. The course of these waves appears to be as follows. The principal tide wave, after entering the Gulf between Cape Breton and Newfoundland, sends off, laterally, waves to the south-west, on either side of the Magdalen islands. The first of these, the eastern wave, coming from between those islands and the western shore of Cape Breton island, arrives at the eastern entrance of the Strait soon after 8 o'clock, and proceeds to the westward, making high water later in succession from east to west as far as Pictou, which it reaches at 10 hours. At the same nominal hour, but twelve hours later, the other or western wave arrives at Cape Tormentine, having been retarded by the long detour which it has taken to the northward and westward of the Magdalen islands,

* *See* Charts:—Gulf of St. Lawrence, General, No. 2,516; scale, $d = 3{\cdot}7$ inches; and Sheets 8 and 9, Nos. 1,747, 2,034; scale, $m = 0{\cdot}25$ of an inch.

and by the great extent of comparatively shallow water which it has passed over in its subsequent progress to the south-west. This wave makes high water later in succession at places along the eastern coast of New Brunswick, as we proceed to the southward; and, after entering the Strait, from north-west to south-east, contrary to the course of the other or eastern wave.

Thus, it is high water, full and change, at Miscou at about $2\frac{1}{2}$ hours; at Escuminac point, and the North point of Prince Edward island forming the western entrance of the Strait, soon after 4 hours; at the West point of Prince Edward island at 6 hours; at Shediac at 8 hours; and at Cape Tormentine at 10 hours.

When, therefore, the eastern wave arrives between Pictou and the Wood islands, the western part of the preceding tide wave arrives between Cape Tormentime and Cape Traverse. They then meet and combine to make high water at the same hour, namely 10 hours, or a little later in the harbours, all over the central portion of the Strait from Pictou to Cape Tormentine; causing also an amount of rise of the tides everywhere more than double, and in some of the harbours nearly three times as great as that which occurs at either entrance of the Strait.

The direction of the tidal streams corresponds generally, and in fine weather, with the progress of the tide wave, but is disturbed occasionally by strong winds. The eastern flood stream enters the Strait from the north-east, running at the rate of $2\frac{1}{2}$ knots round the East point of Prince Edward island, but is much weaker in the offing and over towards the southern shore. It runs round Cape Bear, and with an increasing rate along the land to the westward; is strongest in the deep water near the land, and runs at its extreme rate of 3 knots close past the Indian rocks and Rifleman reef. Losing strength as it proceeds farther to the north-west, it is quite a weak stream, when it meets the other flood stream off the Tryon shoals.

This eastern flood stream is not so strong along the southern or Nova Scotia shore, unless it be in the Caribou channel for a short space near the Caribou reef; and it is weak, not generally exceeding half a knot, in the middle of the Strait.

The other or western flood stream comes from the northward, along the west coast of Prince Edward island, sweeping round West point, and running strongest in the deep water near the West reef, where its rate is $2\frac{1}{2}$ knots. Over towards the New Brunswick shore its rate seldom exceeds $1\frac{1}{2}$ knots, and this is its average speed as it pursues its course to the south-east, until near Cape Tormentine, where the strongest part of the stream runs near the Jourimain shoals, and thence to the southward round and over the dangerous Tormentine reefs with a great ripple, and at the rate of 3 knots.

After passing these reefs, part of it curves round to the south-west with decreasing strength, and unites with the other flood stream in the Bay Verte, whilst the remainder is lost in the central part of the Strait. The ebb stream, generally speaking, pursues a contrary course to the flood, and at nearly the same rates.

From this account of the tidal streams it appears that a fast sailing vessel, under favourable circumstances, might enter the Strait with the flood, and, arriving at Cape Tormentine soon after high water, might there take the ebb, and thus have the stream with her, with but slight interruption, from one end of the Strait to the other. Or, a vessel beating with the flood, might so time her arrival at the same point as to be able to continue her voyage in the same direction with the ebb.

The tidal streams were observed in general to change their directions soon after it was high water or low water by the shore; but not unfrequently there were exceptions to this which it would be difficult to account for with certainty. Strong winds in the Gulf greatly influence the strength and direction of the streams in the Strait, as well as the height to which the tides rise; moreover, as the two tide waves which meet in the central parts of the Strait are twelve hours different in age, so they are in consequence of unequal heights, owing to the diurnal inequality; each of them being alternately and in turn the highest, and probably occasioning the stronger stream.

But, it would require a long series of simultaneous observations at different points, and continued through the different seasons of the year, to reduce to order or to explain satisfactorily the seeming irregularities thus produced. Nevertheless, enough remains, of general occurrence during the summer months, which it is highly useful for the seaman to know, and which has been stated in consequence.

DIRECTIONS.—Vessels bound to Miramichi, and the ports in the Strait of Northumberland to the westward of Cape Tormentine, after entering the Gulf on either side of the island of St. Paul, usually pass to the southward of the Magdalen islands, and round the North point of Prince Edward island. The reef off this last named point is exceedingly dangerous (page 83), and the lead should be kept constantly going when approaching it at night or in foggy weather; bearing in mind the probability of having been previously set to the southward in crossing from the Magdalen islands, especially if the wind has been from the northward.

Under the same circumstances, after rounding the North point, the course should be shaped well to the westward, so as to ensure clearing the West reef (page 84), which should be passed by the lead, running along the edge of the bank off the New Brunswick shore. Proceeding south-eastward, after having passed the West reef, the lead will afford [illegible]ut guidance along either shore, reference being had to the soundings

in the Admiralty chart, until the vessel is near the narrow part of the Strait at Cape Tormentine.

There, if bound farther to the eastward, the shore of Prince Edward island should be preferred, the soundings on that side being quite sufficient to guide the vessel past Carleton head, Cape Traverse, and more particularly the Tryon shoals, if the irregular tides off the latter, and the frequent set of the ebb stream towards them be remembered (page 89). The tides, however, in this narrow part of the Strait are not very strong along the Prince Edward island shore, off which the anchorage is good, in the event of the wind failing ; whilst on the opposite side there is deep water, and very strong tides close to the Jourimain and Tormentine reefs (page 53).

If the wind be adverse, or scant from the southward, with the ebb tide running, a stranger had better not attempt this narrow passage at night, or when the land cannot be seen. Under such circumstances it is recommended to anchor to the westward of Cape Tormentine, till daylight or a change of tide renders it less hazardous to proceed.

Vessels bound to ports in the eastern division of the Strait, enter the Gulf either through the Gut of Canso or by the island of St. Paul. In the first case, the bearing of the light at the northern entrance of the Gut will guide them up to Cape George, from which, if bound to Pictou, there will be no difficulty in running along the land to the westward, if due attention be paid to the soundings in the chart, and afterwards to the bearing of Pictou island and Pictou harbour lights. If the weather be thick, or the light not seen, beware of the reef off the east end of Pictou island, which should not then be approached nearer than the depth of 10 fathoms, especially if the flood-tide be running. For the dangers around that island, see pages 73, 74 ; and for those on the opposite shore of Nova Scotia, pages 71 to 81 inclusive.

Vessels approaching from St. Paul island, and entering the Strait at the East point of Prince Edward island, should not approach the latter nearer than the depth of 20 fathoms in dark nights or thick weather. If the night be clear the light on Sea-Wolf island will be of service (page 139).

Cape Bear and its reef should not be rounded in less than 15 fathoms, under the same circumstances ; regard being had to the light on Panmure head (page 106) ; and then, if bound anywhere to the westward of Pictou, the vessel should be kept more over towards Pictou island and the southern shore, where the soundings will guide her, till the Indian rocks and Rifleman reef (page 100) are passed. The light on Prim point (page 91), will greatly assist in passing the last named danger, after which the lead will again afford sufficient guidance along the Prince Edward island shore, past the Tryon shoals, and through the Strait to the

north-westward. Additional lights on the East, North, and West points of Prince Edward island are much required, and have been recommended.

On the opposition, or Nova Scotia shore westward of Pictou, the principal dangers to be avoided are the Middle shoals (page 73), between Pictou island and Caribou; Amet island and shoals; and Waugh shoal (page 67). The approach to all these is sufficiently indicated by the soundings, and therefore a constant use of the lead, and a careful reference to the chart, will enable the intelligent seaman to pass them at all times in safety; and also to conduct his vessel to any of the harbours of this coast, where pilots will readily be obtained.

From the account which has been given of the tides in this Strait, it will be perceived, that they are very different from anything that can be gathered from preceding publications; and the Admiralty charts will show that the soundings are no less so, for they vary greatly, both in the nature of the bottom and the depth of water; thus affording much more assistance to vessels than they would have done, if they had been of the more uniform character which has been erroneously attributed to them.

PART IV.

CHAPTER XIX.

GULF OF ST. LAWRENCE; SOUTH COAST.—COAST OF NOVA SCOTIA, AND NORTH-WEST COAST OF CAPE BRETON ISLAND.

VARIATION 23° to 26° West in 1860.

GEORGE BAY is of great extent, being $13\frac{1}{2}$ miles wide at entrance, between Cape George and Henry island, and 20 miles deep, from the same cape to the Gut of Canso. It is traversed by all the numerous vessels which pass in or out of the Gulf by its southern entrance, and hence its navigation assumes a more than usual degree of nautical importance. The description of the Nova Scotia coast, which forms its western and southern shores, will now be resumed, from the point reached at the conclusion of the 16th chapter, page 81.*

Cape George, the north-west point of this bay, is a bold and precipitous headland, composed principally of slate, conglomerate, and trap rocks, attaining the elevation of 600 feet above the sea. The shallow water does not extend off it beyond a quarter of a mile, but as there is a depth of 20 fathoms at double that distance, the lead affords but little warning, and it should therefore be approached with caution in dark nights or thick weather. Off Ballantyne cove, on the eastern side of the cape, there is an anchorage in westerly winds, but the ground is not very good.

ISAAC ROCK, with 9 feet least water, is the centre of a small detached shoal, distant nearly 3 cables from the shore, between Isaac point and a remarkable patch of white gypsum cliff. This rock, which is the only danger on the west side of George bay, bears from the gypsum patch E. by N. $\frac{1}{2}$ N. two-thirds of a mile: it is distant $2\frac{1}{4}$ miles to the northward of the entrance of Antigonish, and is shown occasionally by heavy breakers.

* *See* Chart :—Gulf of St. Lawrence, Sheet 9 ; scale, $m = 0{\cdot}25$ of an inch.

ANTIGONISH HARBOUR, at 11 miles S.S.W. from Cape George, and midway between Isaac point and Monk head, is nearly a cable wide at entrance, between low points of sand, from which a dangerous bar extends to the distance of half a mile. Two *beacons*, on the northern point of entrance, kept in one, and bearing W. by N. northerly, led over this bar, at the time of the survey, in 6 feet at low water; but both the depth and direction of the very narrow channel are said to change occasionally. The anchorage off the bar is not very good, and would be quite unsafe in a gale from the north-east.*

TIDES.—In the entrance of Antigonish harbour, it is high water, full and change, at about 9h; the rise being 4 feet in ordinary spring tides, and 2 feet in neap tides. Northerly winds cause high tides, and southerly winds the contrary. The rate of the tides in the entrance seldom exceeds 2 knots, unless it may be in spring, after the melting of the winter's snow.

The harbour is of great extent, running in 6 or 7 miles to the south-west; the channel, between flats of mud and weeds, having in some places 5 or 6 fathoms water. The scenery is exceedingly beautiful, the shores being broken into numerous coves, points, and islets, while a range of hills rises behind the western shore to the height of 760 feet above the sea. There are flourishing farms on either side, and the village of Antigonish, containing about 600 inhabitants, and two churches, stand at the head of the western arm, distant $6\frac{1}{2}$ miles from the entrance. Gypsum abounds here, forming with lumber, and the produce of an increasing agriculture, the cargoes of the schooners which frequent the harbour.

MONK HEAD is a cliff of gypsum 45 feet high, bearing S.E. $2\frac{3}{4}$ miles from the entrance of Antigonish harbour. A rocky bank, with 3 fathoms least water, extends off it three-quarters of a mile to the eastward; and there are no more than $4\frac{1}{2}$ fathoms at double that distance from the shore.

POMQUET HARBOUR has its narrow entrance, at the eastern extremity of a range of low sand-hills and sand beach, $2\frac{1}{2}$ miles S.S.E. from Monk head, and in the bay between it and Pomquet point. It is an extensive place, branching into two principal and many smaller inlets, coves, and islets. It is navigable for small craft and boats nearly 3 miles in from the sea, but it is of no use to shipping, having usually only a depth of 2 feet at low water over its shifting bar of sand. The principal settlements and the church are on the western shore of the north-west arm; and the Indians

* *See* Plan of Antigonish Harbour, No. 2,055; scale, $m = 2{\cdot}7$ inches.

have a chapel and a reservation of land on the eastern and larger branch, at the head of which is Pomquet river, a small stream.*

POMQUET ROAD.—Pomquet island, which bears S. ½ E. distant 14¼ miles from Cape George, is of red sandstone, low, wooded, about half a mile long, and is joined by a reef to Pomquet point, from which it is distant 1¾ cables. The reef dries out from the point more than half way over towards the island, and leaves a passage with only 3 or 4 feet in it at low water. Shallow water runs out from the island nearly 4 cables to the E.N.E., and a reef, with a large rock near the end of it, dries out from its eastern shore to the distance of 1½ cables.

Pomquet road is sheltered by the island and its reefs from all points excepting between N.E. by N. and East. This roadstead, which is considered safe during the summer months, but where the riding must be very heavy in north-east gales, is in the bay between Pomquet point and Little river; which last admits boats only at high water, and with its church and settlement will be seen bearing S. by W. at the distance of a long mile from the island. Vessels may anchor in any depth from 3 to 6 fathoms over sandy bottom, but the best sheltered berth is in 4 fathoms at low water, with the south point of the island bearing N. by E. ½ E., distant half a mile.

DIRECTIONS.—To run for this anchorage from the northward, pass the eastern shore of Pomquet island at the distance of half a mile, or in not less than 8 fathoms water, until Pomquet point comes in sight to the southward of the island, when haul to the westward into the bay.

Approaching from the eastward, the Bowman bank must be avoided in a vessel of large draught, either by the lead, or by not bringing the north point of the island to bear to the westward of W.S.W. until the north point of the bank is passed. The bank is of great extent, running off fully 2 miles to the northward from Quarry point and Bowman head; and has rocky patches on it, with 13, 16, and 19 feet at low water, at various distances, from three-quarters to 1½ miles off shore.

POMQUET BANKS lie off Pomquet island to the N.N.E., distant from 3 to 6 miles. The soundings on them are rocky and irregular, the least water, 6 fathoms, being on the outer and smaller of the two banks, with the church at the Little river shut in behind the east side of the island, bearing S. by W. ½ W. 5½ miles.

TRACADIE HARBOURS.—Tracadie harbour, at 3½ miles E.S.E. from Pomquet island, has its narrow entrance about half a mile to the

* *See* Plan of Pomquet and Tracadie Harbours, No. 2,032; scale, $m = 2$ inches.

eastward of Bowman head. It is extensive, and has 14 feet water in some parts within, with many coves, islets, and small streams, the principal of which, called Tracadie river, is at the head of the eastern arm, $2\frac{1}{2}$ miles in from the sea. The depth over its dangerous bar of gravel and stones is only 2 feet at low water in a narrow and crooked channel; it therefore admits only boats, or very small vessels at high water. The village of Tracadie and the church are situated about a mile within the entrance. The church is large and can be seen from a great distance out at sea.

Little Tracadie, a similar but much smaller harbour, with only one foot at low water over its bar, lies $2\frac{3}{4}$ miles farther to the eastward. Its entrance is in the bay between Barrio head and Cape Blue, the former being a cliff of red sandstone 110 feet high; the latter remarkable from being of limestone, and sheltering the entrance from north-east winds. The inhabitants of these small harbours, including Pomquet, are Acadians, of French extraction, who live principally by agriculture; fishing only to a limited extent during the herring and mackerel seasons.

JACK SHOAL.—Cape Jack, a cliff of red sandstone, 45 feet high, is the most prominent headland on this part of the coast, forming the extreme point all the way from Pomquet island, from which it bears E. $\frac{3}{4}$ S. $7\frac{3}{4}$ miles.

Jack shoal runs out from the cape N.E. by N. one mile to 3 fathoms water, and $1\frac{1}{2}$ miles to 5 fathoms. Between the distances of half and three-quarters of a mile off shore, there are two large patches of rock, which dry at half tide; leaving a passage, carrying 11 or 12 feet water, for small craft, between them and the cape.

CAUTION.—The Jack shoal has often proved dangerous to vessels in thick weather, when it should be approached with great caution, especially from the eastward; the soundings on that side being irregular and deep near the shoal, but nevertheless quite sufficient to ensure safety, if the lead be kept going, with reference to the Admiralty chart. On the outer point of the shoal, in 3 fathoms, the lighthouse at the north entrance of the Gut of Canso bears S.E. $\frac{1}{2}$ E. $3\frac{1}{3}$ miles; therefore a vessel will be clear of this danger if the light be not brought to the eastward of S.E. $\frac{1}{2}$ S. If the light cannot be seen, the shoal should not be approached nearer than the low water depth of 10 fathoms.

HAVRE BOUCHE is a small but convenient harbour for schooners, lying between Cape Jack and the above lighthouse. It has 4 feet, at low water, in its narrow entrance between stony points, having no bar outside; and 13 or 14 feet within. There is a small stream at its head. The shores and neighbourhood are well cultivated, and the church will be seen near the shore, and a mile to the westward of the entrance, or half way towards Cape Jack.

TIDES.—It is high water, full and change, at Havre Bouche, and the other three small harbours last described, at about 9½h., and the rise, unless increased by northerly winds, is from 4 to 2 feet, accordingly as it may be spring or neap tides.

LIGHT.—The lighthouse at the north entrance of the Gut of Canso is a conspicuous object, standing on a bank on the western or Nova Scotia shore, 100 yards within the high water mark. It is a square building of wood, 35 feet high, and painted white. It exhibits at an elevation of about 110 feet above the sea, a *fixed white* light, which can be seen in favourable weather from all the northern parts of George bay, at the distance of about 18 miles. It was established in the year 1842, and has proved of the utmost benefit to the numerous vessels which pass through this great thoroughfare.*

ANCHORAGE.—Half a mile to the south-east of the above lighthouse, and on the same side of the Gut, there is tolerable anchorage in all but northerly winds. Vessels frequently stop there to wait tide (page 147).

CAPE BRETON ISLAND,—NORTH-WEST COAST.

CAPE BRETON ISLAND, which is separated from Nova Scotia by the Gut of Canso, is of an irregular triangular shape, and its west coast is dangerous of access, and possesses no harbour but Port Hood. Its other shores, though rugged, are indented with numerous bays and inlets, the largest of which, the Bras d'or Lake, nearly divides the island into two, and being deep enough for vessels of large draught, affords great facilities for commerce.

The commercial resources of the island consist chiefly in its timber, its agricultural productions, and its fisheries. The coal mines are worked in the neighbourhood of Sydney, and in 1851 yielded 53,000 chaldrons. There is abundant room, and fair means of providing subsistence for a population ten times its present amount, which in 1859 numbered 60,000. Of late years, however, the population has but little increased, for the young men are leaving for other lands. Under the disadvantages arising from want of capital, bad harvests, the failure of potatoe crops, and an unskilled agriculture, the island may languish awhile ; but it is impossible to avoid the conviction, that with its inexhaustible fisheries, productive soil, rich coal fields, convenient harbours, and its healthy climate, it must become before long the seat of manufactures, and the abode of a rich and numerous people.

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* *See* View on Chart, Gut of Canso, No. 2,342.

Crossing the northern entrance of the Gut of Canso, from the lighthouse to Cape Breton island at Heffernan point, a distance of $1\frac{1}{3}$ miles, the description will be continued northward along the western shore of the island. For the first 7 miles there are no detached dangers, nor does the shallow water anywhere extend to the distance of half a mile from the shore. The land is high, and rather barren looking, rising, at the distance of half a mile from the shore, to the summit of a ridge 850 feet above the sea, and which continues parallel to the coast line for 5 or 6 miles. The only remarkable object in this interval is the church at Craignish, which will be seen bearing N.E. $\frac{1}{2}$ E. and distant $2\frac{3}{4}$ miles from the lighthouse. At long point, a low cliff of red sandstone, the coast becomes dangerous of approach, and continues so to Emersion point, a distance of 7 or 8 miles.

JUDIQUE SHOAL, the greatest danger in George bay, is of rock, and about half a mile in length, if the very shallow part is only reckoned, but there are patches with 2 or 3 fathoms, and much rocky ground both to the north and south of it, as will be seen in the chart.

On the outer and north-west point of the shoal, the church at Port Hood is only just shut in behind Susan point, bearing N.N.E. ; Long point bears S. by E. $2\frac{3}{4}$ miles ; Campbell point (the nearest part of the shore), E. $\frac{1}{2}$ S. $1\frac{1}{4}$ miles ; and Judique church (a large wooden building without a steeple), N.E. by E. The least water, 4 feet, is close to the outer point of the shoal, and when on it the western extremity of the highland of Cape Porcupine will appear in the same line as Flat and Heffernan points, which form the right extremity of Breton island at the entrance of the Gut of Canso, and which bear S. $\frac{1}{2}$ W. By keeping the whole of the highland of Cape Porcupine open to the west of Heffernan point, it will lead to the westward of the shoal in 6 or 7 fathoms; or if the church at Port Hood be kept open to the west of Cape Susan, the shoal will be cleared in not less than 4 fathoms. There are 4 fathoms water between this shoal and the land, but only small craft should attempt the passage.

JUDIQUE BANK lies N.N.W. $2\frac{3}{4}$ miles from the Judique shoal, with $4\frac{1}{2}$ fathoms least water on a small rocky patch, with much foul ground around it. When on this patch, Portsmouth point (the south end of Smith island), and Cape Linzee will appear touching, and bearing N.N.E. $\frac{1}{2}$ E. ; Judique church, E. by S. $\frac{1}{2}$ S. $3\frac{1}{4}$ miles ; and the left or eastern termination of the highland of Cape Porcupine just shut in behind Heffernan point. A vessel will pass to the westward of this bank, which is only dangerous to vessels of large draught when there is a heavy sea running, by keeping Cape Linzee shut in behind Smith island ; or the whole of the highland of Cape Porcupine open to the westward of Heffernan point.

Judique pond, close to the north of Judique church, is barred by a sandy ridge, so as only to admit boats at high water. The shallow water extends off it to the distance of $1\frac{1}{4}$ miles. Catherine pond and Susan creek, distant 3 and 5 miles respectively to the north of the church, are similar places; the latter admits boats at high water, and is situated just to the north of Cape Susan, rendered remarkable by the white gypsum in its cliffs.

PORT HOOD, the only safe anchorage on the west coast of Cape Breton island to the north of the Gut of Canso, was formerly a much more secure harbour; Smith island being then a peninsula, united to the mainland by a range of high sand-hills, which has since been entirely swept away, and the sand widely spread over the northern parts of the harbour.* The first breach in this sand-bar was formed by the sea about 20 years ago, during a heavy gale from the north; it was at first a very narrow channel, and might perhaps have been easily closed, but, being neglected, the tidal streams enlarged it with increasing rapidity, until the present channel, 6 cables wide, and with 9 feet in it at low water, was formed between the island and the mainland. The combined action of the waves and tides is said to be still widening and deepening this passage, thus admitting more and more the heavy swell from the north, and thereby rendering the harbour insecure, excepting over towards Smith island, the eastern side of which forms a bay where the anchorage is still quite safe with all winds.

At this anchorage, in which vessels may choose any depth from 3 to $4\frac{1}{2}$ fathoms, the bottom is of mud which holds well, and the heavy swell is prevented from rolling in round the north-east extreme of the island, by a long shoal, derived from the ruin of the sand hills, and which runs to the southward from Smith point, with only 4 feet water on it for the first 3 cables, and less than 3 fathoms for an equal distance farther. This shoal must be carefully avoided in hauling in to the anchorage. The shelter from all south winds is complete, being afforded by the Spithead, which is a sandy flat, nearly dry at low water, extending 6 cables to the eastward from Portsmouth point, the south extremity of the island. A vessel will pass at the distance of half a cable to the eastward of the Spithead, which is very steep and can usually be seen, by keeping the small fish-shed, on the wharf next within Smith point, exactly in line with the chimney of the house behind it, bearing N. $\frac{1}{4}$ W.

Supplies.—The village of Port Hood will be seen on the mainland opposite the northern part of Smith island: it is well situated, and will be recognized by the steeple of the church, and the court-house of stone. Supplies of fresh provisions may be obtained there, but there is no good

* *See* Plan of Port Hood, No. 2,018; scale, $m = 4$ inches.

watering place, the supply from the wells of Smith island being scanty and not very good, while the brooks of the mainland are difficult of access, and sometimes nearly dry in summer.

Dean Shoal is on the mainland side of the port, and runs off from the sandy beach at Mill creek to the distance of 3 cables. It is a steep sandy flat, which, together with the shallow water, as far out as opposite Portsmouth point, but not farther to the south, will be cleared at the distance of a cable, by keeping Cape Linzee and Isthmus point in line, bearing about N. by E. $\frac{1}{4}$ E. On the same side, but outside the entrance of the harbour, a rocky shoal, with 13 feet least water, runs out $3\frac{1}{2}$ cables from the shore half a mile to the northward of Ragged point. This being steep-to, must be carefully avoided by a vessel of large draught. Cape Susan and Kate point in one, bearing S. by W., just leads outside it, but may not be easily made out by strangers.

Smith Island is 2 miles long, and 210 feet high: it possesses much fertile land, and the two Smiths, father and son, have flourishing farms on the inner side of the island. The elder Smith's house and barn will be seen in the bay, and those of the younger, together with his fish shed and wharf, farther to the north-east, near the other end of the sandy beach, and a quarter of a mile within Smith point. These objects are mentioned because they form leading marks for the anchorage. With the exception of the sandy beach in the above bay, the island is everywhere surrounded by cliffs of various heights up to 123 feet. They are formed of soft reddish sandstones, shales, and marls, containing occasionally thin seams of coals, with beds of gypsum, limestone, and trap, which last are well shown at the north-west end of the island.

Henry Island, or Just au Corps, lies about a mile outside or W.S.W. from Smith island. It is much the smaller of the two, being one mile long, and its greatest height is 195 feet above the sea at high water. It is of the same rock formation, and also nearly surrounded with cliffs which yield rapidly to the action of the waves and of the atmosphere; and which on the outer side attain the elevation of 100 feet above the sea. It has no permanent inhabitants, but is much frequented by fishermen during the fishing seasons.

This island is bold to seaward, but shallow water runs out from Fishery point, its south-east extremity, one-third of a mile to the depth of 3 fathoms, and three-quarters of a mile to 5 fathoms.

The passage between these islands is rendered so extremely intricate and dangerous by rocky shoals, that it should never be attempted unless in a very small vessel and with fine weather.

LIGHT.—The lighthouse erected on the cliff to the southward of Mill creek, at the south entrance to Port Hood, is a small square building

coloured white. It exhibits, at 54 feet above high water, a *fixed* light, which shows *red* to the northward and *white* to the southward.

DIRECTIONS.—The following directions, with reference to the Admiralty plan, will enable the intelligent seaman to take his vessel in or out of Port Hood with safety :—Having a fair wind, pass to the southward of Henry island at a distance not less than a quarter of a mile, steering E. by S. until the church at Port Hood opens out to the southward of Portsmouth point, then alter course so as to pass the latter at the distance of 3 or 4 cables, or in not less than 5 fathoms water, taking notice that the shallow water off it extends to the distance of nearly $2\frac{1}{4}$ cables. This course should be a little to the northward of E.N.E. and directly towards a house rendered remarkable by its lower story being of stone while the upper part is of wood, and which should be nearly in line with, or only just open to the northward of a hut near the entrance of a small brook at the north end of a range of cliffs. Continue this course until Henry point (north end Henry island) and Portsmouth point come in one, when steer directly for the church, or N.E. $\frac{1}{2}$ N., until the younger Smith's fish shed (on the wharf next within Smith point) comes in line with the chimney of his house bearing N. $\frac{1}{4}$ W. Keep these marks exactly in line, running towards them (they will lead in clear of the Spithead bank, as already mentioned), and when the south-west end of the elder Smith's barn comes in line with the chimney of his house, bearing N.W. by N., steer directly towards them, until Cape Linzee comes in one with Smith point ; when the vessel will be in the best anchorage, and in 4 fathoms at low water, with mud bottom.

If any difficulty be experienced in distinguishing the younger Smith's fish shed, let the N.E. $\frac{1}{2}$ N. course towards the church be continued until Isthmus point and Cape Linzee are in one, then alter course and keep them so, running towards them until the south-west end of the elder Smith's barn comes in line with the chimney of his house, bearing N.W. by N. ; and these last named marks will lead to the anchorage, as before stated.

TIDES.—At Port Hood it is high water, full and change, at 9h. ; and ordinary springs rise $4\frac{1}{2}$ feet, and neaps 2 feet. The tidal streams are weak at the anchorage, and their rate does not ordinarily amount to one knot anywhere within the harbour. The flood comes from the north, and the ebb from the south. The flood stream from the north meets that which comes in through the Gut of Canso off Long point, whence they set to the north-west, curving round the bay towards Cape George.

ASPECT of COAST.—At Cape Linzee, $1\frac{1}{2}$ miles northward from Port Hood, the north-west coast of Cape Breton island trends to the N.E. by E.,

continuing in that direction to Cape St. Lawrence, a distance of 73 miles, without either harbour or safe anchorage for ships. The general character is high and bold, the dangers being few and close in shore, but it is nevertheless a dangerous coast to be near in autumn or early winter, when the prevailing north-west winds send in a heavy sea, and the set of the current is often in the same direction. The swell frequently precedes the wind by many hours, and, as there is no good holding ground, becomes dangerous to vessels caught close in shore.*

The prevailing rocks of this coast are sandstones, shales, and conglomerates, with occasional beds of gypsum and thin seams of coal, together with a more ancient slate formation, in nearly vertical strata, forming the higher hills and rising in one part to nearly 1,300 feet above the sea. These rocks form precipitous shores, on which boats can land only in fine weather, at the mouths of ravines or small streams. The soil, especially in the valleys and lower grounds, appears to be productive and well suited to the rearing of cattle, considerable quantities of which are annually exported from the Mabou and Margaree rivers. The settlements continue along the coast as far northward as Chetican, after which, the mountains approach close to the shore, excepting at Grandance, where there are seven resident families.

The FISHERIES are valuable. Salmon are taken in all the principal streams, and the Margaree is so celebrated for its salmon fishery, that it has sometimes been called the Salmon river. Herring, mackerel, cod, &c., abound in their seasons, and are frequently taken in large quantities. The seal fishery is also attempted occasionally, but is a precarious pursuit.

CURRENTS.—Even with a smooth sea and in fine summer weather, vessels are set in towards this coast ; an effect which seems to be due sometimes to the general current from the north-west coming from between the Magdalen islands and Prince Edward island, and at other times to the direction of the ebb stream from the Strait of Northumberland inclining towards these shores. These streams, being inconstant and irregular both in strength and direction, are therefore the more dangerous, and require the more to be guarded against. In the summer months, however, the rate of the current or tides will not be found to exceed one knot even close in shore, excepting round Cape St. Lawrence and Cape North, where it sometimes runs at the rate of 2 or 3 knots, causing a heavy breaking sea. Its direction for three-fourths of the time is from the westward ; this appears to be due to the combined action of the current and ebb tide predominating over the flood stream from the north-east, so as to render it nearly imperceptible, excepting at or near the spring tides. There is

*See Chart :—Gulf of St. Lawrence, Sheet 10, Cape Breton Island, No. 2,727 ; scale, $m = 0{\cdot}25$ of an inch.

no doubt that winds, present or at a distance, also influence these streams, as they have been observed to do in all parts of the Gulf.

Having made these general remarks, a brief description will now be given of the few places which afford shelter to small craft along the coast.

MABOU RIVER, at 5 miles from Port Hood, admits small schooners, having 4 feet at low water over its bar of sand. The bar shifts occasionally during heavy north-west gales, but is seldom disturbed during the summer months, when those gales are of rare occurrence.*

From the entrance to the bridge, a distance of $3\frac{1}{4}$ miles, this river resembles a mountain lake, being in one part three-quarters of a mile wide and carrying 8 fathoms water. Boats can ascend with the tide to 2 or 3 miles above the bridge, where the fresh water forms only a small stream. Besides the Mabou, which is the main branch, there are two other smaller streams, the South-west Arm and Becket river, which last enters from the eastward.

The shores of the Mabou are well settled, principally by Scotch highlanders; flourishing farms are seen on either side, and there is a church on the northern bank 3 miles within the entrance. The scenery is very beautiful, the mountains rising immediately from the northern shore to the height of 870 feet.

TIDES.—The entrance to Mabou river, at the southern end of a low sand bar, is only half a cable wide, and the tides frequently run there at the rate of 4 knots; it is therefore a dangerous place to enter, excepting with a flowing tide and a smooth sea. It is high water there, full and change, at about 9h.; the rise in ordinary springs is 4 feet, and in neaps 2 feet. North-east winds often cause high tides; south-west winds the contrary.

The MABOU HIGHLAND is a very remarkable feature of the coast, seen from great distances seaward. It extends 11 miles along the coast to the north-east, forming a lofty and precipitous shore, and rising to the height of 1,000 feet above the sea. After passing these highlands, the coast becomes less elevated, the beaches and landing places more frequent, and the settlements are continuous until past Chetican island.

SEA WOLF ISLAND, distant 23 miles N.E. from Port Hood, is of an oval shape, $1\frac{1}{10}$ miles long, parallel to the shore, 3 cables broad, and 200 feet high. It is of sandstone, precipitous and quite bold all around, excepting at the north-east point, and there the shallow water extends only to the distance of one cable. It affords some shelter to small fishing-vessels and boats, which can land upon it only in fine summer weather;

* *See* Plan of Mabou Harbour, No. 2,028; scale, $m = 4$ inches.

at other times the sea rolls completely round it, and the anchorage is never safe, the ground being everywhere rocky.

The depth between this island and the shore, from which it is distant rather more than 2 miles, is 7 fathoms, over a bottom of rock, with loose sand and gravel occasionally. The neighbouring sea abounds with fish.

LIGHT.—The lighthouse erected on the summit and near the middle of Sea Wolf island, is a square white building, showing at 298 feet above the level of the sea, a *fixed white* light, visible in clear weather from a distance of 21 miles. To vessels in dangerous proximity to the island, the light may become obscured by the abrupt cliffs on the sides of the island.

MARGAREE RIVER, at $7\frac{1}{2}$ miles to the north-east of Sea Wolf island, has 5 feet over its rocky bar at low water, in a very narrow and intricate channel, through which the tides run at the rate of 4 knots. It is only under favourable circumstances of wind and weather, and with a smooth sea, that schooners can safely attempt to enter it. The surf on the bar is at times heavy and dangerous to boats, especially when the strong tide is running out against the wind and sea. The shores of this river are well settled, principally by Acadians and Scotch highlanders, who, besides farming, prosecute the salmon and other fisheries.

TIDES.—It is high water, full and change, in Margaree river, at 8h. 40m., and ordinary springs rise $3\frac{1}{2}$ feet, and neaps 2 feet. Boats can ascend 5 or 6 miles from the entrance, at which distance the tide ends.

SQUIRREL POND.—Between the Margaree and Chetican island there are several places where boats can land in fine weather, especially at Squirrel Pond, distant 3 miles from Chetican. There are farms all along this part, the mountains running parallel to the shore, at a short distance back, and attaining, at Mount Squirrel, in rear of Squirrel Pond, the elevation of 1,220 feet above the sea.

CHETICAN ISLAND and HARBOUR.—Chetican island, distant 10 miles N.E. from the Margaree, is only an island when high tides overflow the low and narrow beach of sand and shingle which, at other times, unites it to the mainland at its southern extremity. This beach forms the shore of the bay, within the south-west point of the island, where the Jersey brig, employed in the fisheries, usually lies moored during the summer months ; receiving some shelter from the shoal which runs out half a mile to the southward from Chetican point, but completely exposed to winds from between S.W. and N.W., which send in a heavy sea. The depth of water in this roadstead is $4\frac{1}{2}$ fathoms, but the bottom, of sand and gravel, is so loose and bad for holding, that the anchorage becomes quite unsafe after the month of August ; as was experienced by one of the Jersey vessels several years ago, when she was driven from both anchors, and completely

wrecked on the beach: since which accident they endeavour to leave before the commencement of the September gales.

At no time is this anchorage to be recommended, and therefore vessels merely wishing to communicate with the shore had better anchor outside at the distance of a mile or two, where they will have room to weigh in the event of the wind coming in from the westward.

There is no landing on the outside of Chetican island, where the cliffs of sandstone, containing coal fossils, are everywhere perpendicular or overhanging, being constantly undermined by the sea. These cliffs, which extend the whole length of the island, from Chetican point north-eastward to Enragée point, a distance of $3\frac{1}{4}$ miles, are nearly equal in elevation to any part of the island, rising in one part to the height of 200 feet above the sea.

Chetican harbour, between the island and the mainland, is entered from the north-east between the shingle spit at Cape Gros, the north-east extreme of the island, and Caveau point. Within this entrance, but outside the bar, which is half a mile farther in, small fishing vessels sometimes anchor, but the northerly winds send in so heavy a sea, that this is considered even less secure than the unsafe anchorage at the south-west end of the island. There is a depth of $3\frac{1}{2}$ fathoms within the harbour, but only 2 feet at low water over its bar of sand, which is then in great part dry.

Supplies.—The establishment of Messrs. Robin and Co., of Jersey, on Chetican point, is the principal fishing station on this coast, and will be easily recognized by the buildings, fish-stages, and flagstaff. There also is the post-office, at which the mail route from the southward terminates. There are several other houses on the inner side of the island, and a settlement of Acadians on the mainland opposite, where supplies of fresh provision to a limited extent may be obtained, and also water, which cannot be had good or in any considerable quantity upon the island.

TIDES.—In Chetican harbour, it is high water, full and change, at $8\frac{1}{4}$h.; and ordinary springs rise $3\frac{1}{2}$ feet, and neaps 2 feet. North-east winds cause high tides, and south-west winds the contrary.

CAVEAU SHOALS and JEROME LEDGE.—The Caveau shoals, which are much in the way of vessels wishing to anchor off the entrance of Chetican harbour, are two rocky patches, with 11 feet least water, lying at the distance of half a mile off Caveau point, and N.E. by E. from one-third to three-quarters of a mile from Cape Gros.

The Jerome ledge, with only 5 feet water, lies in the same direction from Cape Gros, and at the distance of $1\frac{3}{4}$ miles. It is of considerable extent, being two-thirds of a mile long, and its north-east point reaches to the distance of a mile from the shore. The line of 10 fathoms water is only 3 cables outside this ledge and the Caveau shoals: there is therefore little warning from the lead; but vessels beating alongshore, and

standing towards them, will avoid them by tacking when the points on the outside of Chetican island, namely Enragée point and the capes, come in line, bearing S.W. $\frac{3}{4}$ W.

At PRESQU'ILE, 3 miles E.N.E. from Cape Gros, the mountains come close down to the shore, after which there are no inhabitants nor any good landing-place, up to Grandance, 15 miles from Chetican, where there is a settlement of seven families, and a small river silted up by a shingle beach, on which boats can land, and be hauled up in case of need. From Grandance to Cape St. Lawrence, a distance of 13 miles, the coast is mountainous, with precipitous shores, affording an indifferent landing for boats at one or two places, and there only with a smooth sea.

CAPE ST. LAWRENCE, which forms the termination of the north-west coast of Cape Breton island, is of slate rock, affording no landing excepting on the west side, where there is a brook, and a steep stony beach, on which a boat can be hauled up with difficulty. Round this headland to the south-east is the remarkable Bear hill, a sugarloaf 750 feet high, and close to the shore. This is distant less than a mile from the cape; and at an equal distance farther is Black rock, always above water, and about $1\frac{2}{3}$ cables off shore. Meat cove, where there is a settlement, and good landing for boats, lies 3 cables farther in the same direction, and one mile N.W. from Black point.

ST. LAWRENCE BAY, between Black point and Cape North, is $4\frac{1}{2}$ miles wide and $1\frac{3}{4}$ miles deep, with bold shores, and a depth of water not too great for anchoring; but the bottom is not to be trusted, being either of rock or loose sand. Vessels requiring supplies may anchor there in the summer months, when strong northerly winds are of rare occurrence, and will find 9 or 10 fathoms water at the distance of half a mile off shore in the bottom of the bay, but they should be ready to weigh immediately on the approach of a wind from the sea. At Wreck cove and at Deadman Pond there are settlements, and good landing, the principal fishing establishment being at the last-named place.

CAPE NORTH, the north-east extremity of Cape Breton island, is a remarkable, bold, steep, and rocky headland, of slate in nearly vertical strata, rising abruptly from the sea to the height of 1,100 feet. There is no shallow water off it, only some rocks above water, which at Money point, a mile to the south-east of the cape, run off to the distance of a long cable. The passage between this headland and the island of St. Paul (described in page 51, Volume 1,) is 13 miles wide, with very deep water, and no other danger than that which arises from the frequent and heavy squalls which prevail off this great promontory.

CHAPTER XX.

GUT OF CANSO, AND LENNOX PASSAGE.

VARIATION 23° West in 1860.

The GUT of CANSO,* separating Cape Breton island from Nova Scotia, and forming the southern entrance of the Gulf of St. Lawrence, is of great and increasing importance in the navigation of these seas. The number of vessels recorded as annually passing its lighthouse amounts to several thousands, and is constantly increasing with the trade and population of the neighbouring countries. Not only do the numerous fishermen, coal-traders, and coasting-vessels, to and from the ports of Newfoundland, Nova Scotia, New Brunswick, and the United States, use this passage; but also many vessels trading between Great Britain and the southern parts of the Gulf of St. Lawrence; and it is by far the most preferable route for these last, especially when homeward bound in the fall of the year, as it affords them safe anchorage until an opportunity offers for sailing with the first of a northerly or westerly wind, and thus secures a safe offing before the occurrence of the thick weather which almost always accompanies winds from the contrary quarter.

The length of the passage through the Gut, from the lighthouse at the north entrance (page 133) to the lighthouse on Eddy point at the south entrance is 14½ miles; and its least breadth, between Balache point and Cape Porcupine, is 4½ cables. The depth of water in the channel is seldom less than 15 fathoms, and in the deepest part, off Cape Porcupine, it amounts to 32 fathoms. This great depth, the strength of the tides and the rocky or gravelly bottom, render the anchorage unsafe, excepting at the places hereafter to be described.

Excepting at Ghost beach, and for a short distance below Ship harbour, the general character of the shore on either side is high; the land rising from it, more or less abruptly, to the summits of ridges of considerable elevation. Cape Porcupine, a precipitous headland on the western shore, 640 feet high above the sea, is the most remarkable feature, and the scenery in its vicinity is of great beauty. There are increasing settlements

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* Often spelt Canseau; but Canso appears to be the more correct orthography. It was formerly called the Strait of Fronsac. *See* Chart :—Gut of Canso, with Views, No. 2,342 scale, $m = 1$ inch.

on either side, especially at the several anchoring places, where supplies may be obtained.

The rocks, forming the shores on either side, belong to the lower members of the coal formation. They are slates, conglomerates, sandstones, sometimes containing fossils, gypsum and gypsiferous marls, and occasionally carboniferous limestone. This last, containing fossils, is well displayed at Plaster cove; where there are also immense beds of white gypsum, which at once point out that anchorage to strangers.

LIGHTS.—The lighthouse and light at the northern entrance of the Gut of Canso have already been described in page 133. The lighthouse erected on Eddy point, the southern point of entrance, is a square wooden building, painted white, with a black diamond.* It exhibits, at an elevation of 25 feet above the level of high water, two *fixed white* lights, *horizontal*, and eight yards apart, which in clear weather are visible from a distance of about 8 miles.

DANGERS IN GUT OF CANSO.

Generally speaking the shore on either side of the Gut of Canso is bold, but there are nevertheless several small rocks and shoals, which, although at no great distance off shore, have often occasioned serious accidents, and therefore require particular notice. The dangerous Jack shoal, outside the northern entrance, has been already described (page 132).

The following are the dangers within the Gut, as they occur in proceeding through it to the southward.

BALACHE, MADAGASCAR and DIXON ROCKS.—Balache rock is nearly dry at low tides, but, as it is within the line uniting Balache and Mackeen points, it is not much in the way of vessels. It lies at the distance of a cable E.S.E. from the end of Balache point, and half a cable off shore.

The Madagascar rock, dry at low water, lies directly abreast the Balache, and not quite half a cable off the west shore under the highest part of Cape Porcupine. The rippling of the tide over this rock can in general be seen; nevertheless, its situation, off a projecting point in the narrowest part of the passage, nearly in the full strength of the tide, and at a part celebrated for sudden flaws of wind from various directions, renders it extremely dangerous, especially to strangers, who are accordingly recommended to give it a wide berth.

The Dixon rock, reported to have only 6 or 8 feet over it at low water, but on which not less than 12 feet could be found, bears South, distant 140 yards from Mackeen point, and W. by S. 240 yards, from the western

* *See* View on Chart.

point of Plaster cove, which will then appear in one with Martel's house, low down on the eastern shore of the cove, and just outside the bridge. This rock is much in the way of vessels approaching or leaving the anchorage off Plaster cove, but will be avoided if the whole of the bridge over the cove be not shut in behind its western point.

PREMIER and STAPLETON SHOALS.—The Premier shoal, of rock and sand, with 13 feet least water, is a middle ground in the entrance of Ship harbour. Vessels may pass on either side of it, but to the northward is the widest and deepest channel. Ship Harbour point and the western extremity of Pirate island in one, bearing S.W. by S., will lead clear outside or to the westward of this shoal, in 5 fathoms ; therefore, vessels standing in towards Ship harbour, or anchoring off its mouth, should be careful not to shut in the whole of the island behind the point.

The Stapleton shoal is rocky, and extends from Ship Harbour and Stapleton points $1\frac{1}{2}$ cables to the S.W. and West. At that distance off shore there are only 16 feet at low water, but the depth increases almost immediately to 5 fathoms, the edge of the shoal being very steep.

CAHIL and SHIP ROCKS.—The Cahil rock lies on the western side of the Gut, and is distant three-quarters of a mile to the S.E. from Holland cove, and 120 yards off shore. It is dry at low water, but becomes dangerous when covered. Roger point in one with the north-east side of Pirate island (the latter being seen over the low shingle neck of Pirate point), and bearing N.W. $\frac{3}{4}$ N., leads clear outside of it at the distance of 120 yards.

The Ship rock is on the eastern shore, rather more than half way from Stapleton point to Bear head. It has 6 feet least water, and is distant a quarter of a mile northward from Ship point, and 140 yards off shore. Ship point and Bear head in line, bearing S.E. $\frac{1}{2}$ S., lead only 40 or 50 yards outside of it, and therefore, in standing towards it, tack before the head and point come in line.

BEAR REEF and MARTIN SHOAL.—The Bear reef has from 6 to 9 feet at low water over large rocks, and extends nearly $1\frac{1}{2}$ cables southward from Bear island. Off Bear head also there is shallow water, extending nearly 2 cables to the S.E. Great caution should be used in approaching these dangers, for the water is too deep near them for the lead to afford much warning, and there are no good clearing marks.

Crossing again to the western shore of the Gut, at Critchet cove, there is a shallow bank of mud and sand, on which small vessels frequently anchor, but of which vessels of large draught should beware. Its outer edge, in 5 fathoms, is nearly a quarter of a mile off shore.

Martin shoal, 2 miles farther to the S.E., and N.W. $1\frac{3}{4}$ miles from Eddy point, is of rock, and extends nearly $1\frac{3}{4}$ cables off shore. Melford and Critchet points in one, bearing N.W. $\frac{3}{4}$ N., just lead outside its edge in 4 fathoms.

EDDY POINT and SPIT.—Eddy point, the southern point of entrance of the Gut, is of sand and gravel, enclosing a small pond.

Eddy spit, of sand and stones, runs out a quarter of a mile to the north-east from high water mark on Eddy point, and is almost always shown by the rippling of the tide. Ship point and Bear island in one, bearing N.W. $\frac{3}{4}$ N., lead about a cable's length to the north-east of its outer edge.

The deep channel of the Gut of Canso continues to the southward, between the mainland of Nova Scotia and Janvrin island into Chedabucto bay, and being the course of the main stream of the tide from the Gut, as well as of all vessels that use this passage, the description of the dangers on either side will be continued, as belonging to the same line of navigation.

ARGOS SHOAL, consisting of rock, extends to the distance of two-thirds of a mile E. by N. from Cape Argos, and the least water found on it was 20 feet. It is shown by heavy breakers when there is a swell from the south-east.

Cape Argos, distant $2\frac{1}{2}$ miles to the southward of Eddy point, will be easily recognized, being a small but high peninsula, bare of wood, with red cliff, and united to the mainland by a low isthmus of shingle. Off the point of cliff next to the north of the cape, and distant a third of a mile from it, a reef runs off towards the Argos shoal, which it so nearly joins as to leave no passage for vessels of large draught. Eddy point and Flat head touching, and in line with the east side of a hill behind the latter, bearing N. by W. $\frac{1}{2}$ W., lead $1\frac{1}{2}$ cables to the eastward of these dangers in 7 or 8 fathoms. Flat head is the north-east point of Bear cove, and if it be wished to pass outside of the Argos shoal at a greater distance, let the above-named marks be kept proportionally open.

At Cape Argos the coast turns to the south-west into Chedabucto bay, for which see page 164; the eastern side of the entrance to the Gut of Canso, where the shoals off Janvrin island are exceedingly dangerous, will now be described.

THOMAS and JANVRIN SHOALS.—The Thomas shoal runs out from Thomas head (the north-west point of Janvrin island), three-quarters of a mile to the westward, with rocky and irregular soundings, from 11 to 21 feet at low water. The clearing mark for its western extremity is the eastern end of Wasting islet, touching the south end of Peninsula point, bearing S.S.E. $\frac{1}{3}$ E.; and for its northern side the two points forming

the north side of Janvrin island, in one, bearing E. ½ S., when Campbell island will appear just open to the northward of them.

The Janvrin shoal, extending two-thirds of a mile to the westward from Janvrin point, is bank of sand and stones which dries out half of that distance, and has a large rock near its edge. At the distance of 5½ cables from the point there is another rock, with 6 feet least water, from which the south-west extremes of Wasting islet and Peninsula point appear in one. The south-west side of Wasting islet, in one with the north end of Peninsula point, bearing S.E. ¼ E., will lead a cable to the south-west of this dangerous shoal in 5 fathoms water. On the north-west side, where there are no clearing marks, it should be approached with great caution, for the water is too deep for the lead to afford much warning.

WASTING ISLET and PENINSULA POINT, appearing like two small islands, on the edge of the bank which dries out from the south-west side of Janvrin island, will be easily recognized, the islet being most to the north-west. They both have low red cliffs to seaward, and long gravel spits at their north points ; but a long bar of shingle unites the peninsula at its east end to Janvrin island. The very shallow water extends 2 cables off Wasting islet, with a depth of 4 or 5 fathoms for an equal distance farther to the south-west.

PENINSULA SHOALS are much more extensive and dangerous, running off both to the south and south-east. In the latter direction the reef dries out 3 cables, and under water extends to double that distance ; while to the southward there are 6, 16, and 25 feet, at the distance of a quarter, a half, and three-quarters of a mile out from high-water mark. Ship point and Bear head in one, bearing N.W. ½ N., lead to the south-west of these shoals in 6 fathoms water ; and the steeple of the chapel at Arichat and the south extremity of Creighton island in line, bearing E. by S. ¼ S., will lead to the southward at the distance of a third of a mile.

ANCHORAGES IN GUT OF CANSO.

The foregoing brief description of the dangers on either side of the channel of the Gut of Canso is intended to illustrate and to be used with reference to the Admiralty chart ; and with the same design the anchoring-places will now be pointed out.

Vessels may anchor for a tide and in fine weather near the lighthouse at the north entrance, as already remarked (in page 133) ; and also on the western shore of the Gut off Mill creek, which is another occasional stopping place ; but neither of these can be recommended, since they are both exposed to northerly winds, which often commence suddenly and

send in a very heavy sea. Moreover, off Mill creek irregular eddies render it very difficult to keep an anchor clear.

PLASTER COVE, on the eastern shore, and distant 5 miles from the lighthouse, is the first safe anchorage after entering the Gut from the northward. It will be known at once by the conspicuous cliffs of white gypsum, which are 120 feet high on the north-west side, and a short distance within the bridge near its entrance. The cove itself is dry at low water, but the anchorage off its mouth is convenient and safe in all winds. In northerly gales the swell, deflected by Cape Porcupine, causes rather uneasy riding, but it does not endanger vessels well anchored in a clear berth.

The only directions necessary, both for avoiding the Dixon rock (page 144) and choosing a good berth are, to keep the cove open, so that the whole of the bridge as well as the Plaster cliffs above it may be seen. Vessels of large draught should keep Balache point well open, and go no nearer in than 7 or 8 fathoms water; but smaller vessels may anchor in 4 or 5 fathoms, with mud bottom. The bottom is more and more sandy farther out towards the steep edge of the bank in 10 fathoms, after which it becomes rocky in the deep water and strength of the tide.

The Post Office is at Mackeen's store on the western side of the cove, and the mails from Sydney, Arichat, &c. to Halifax and other places cross the Gut from thence to Mill creek.

TIDES.—In Plaster cove it is high water, full and change, at 9h. 10m.; ordinary springs rise $4\frac{1}{2}$ feet, and neaps 3 feet; but extraordinary tides sometimes rise 6 or 7 feet, and at other times only 2 feet.

The tidal streams at this anchorage are eddies, running often irregularly, but generally in a contrary direction to the main stream in the channel, and at a rate seldom exceeding one knot. These eddies render it advisable to moor, especially in large vessels having occasion to remain some time (to water for instance), in which case one anchor should be laid well out to the southward in 9 or 10 fathoms water.

WATER.— There is an excellent watering place directly opposite Plaster cove, in the bay between Cape Porcupine and Keaton point.

SHIP HARBOUR, on the same side of the channel as Plaster cove, and $2\frac{1}{2}$ miles farther to the south-east, it is a large cove, terminated by a bridge nearly a mile in from the sea. It is completely open to N.N.W. winds, which blow directly through the Gut, causing, at times, a heavy sea, excepting when well in towards the head of the harbour, where the anchorage is quite secure, out of the stream of the tides, and in $3\frac{1}{2}$ fathoms, mud bottom.

There is a fine settlement, with two chapels, on the north-east side of the harbour, together with stores and wharves where vessels may receive repairs, or winter in safety.

DIRECTIONS.—Vessels of less than 12 feet draught may run in to Ship harbour without difficulty, passing over the Premier shoal (page 145) at all times ; but vessels of larger draught should prefer the channel to the north of that danger, and attend to the following directions :—

Being outside the shoal, bring Cavanagh point, composed of low sandstone and sandy beach, on the north-east side of the harbour, to bear S.E. $\frac{1}{2}$ S., when a large store built on piles, and farther up the harbour, will appear in line with it, and the end of the wharf will be just in sight. Run in with these marks on until Ship Harbour point bears W.S.W., when the vessel will be within the Premier shoal, and may sheer to the southward into the middle of the harbour. The channel to the southward of the shoal is neither so deep nor so wide as the other, but it is more convenient for entering the harbour with southerly winds ; in which case the chart and the lead will afford sufficient guidance.

The roadstead off the mouth of this harbour, and outside of the Premier shoal, is much frequented by vessels detained by south-east winds, but the riding is very rough there, in winds from the opposite quarter. The depth is from 7 to 9 fathoms, over sand, gravel, and mud bottom, and the only direction necessary is to keep Pirate island in sight to the westward of Ship Harbour point.

VENUS COVE, on the western shore and nearly opposite to Ship harbour, is an excellent anchorage, especially in north-west winds. The best berth is in 6 or 7 fathoms, with mud buttom, and directly off the mouth of the cove. Macnair point in line with Plaster cove, and bearing N. by E., should then be distant about 2 cables. There is a good watering-place here, with wharves for landing at all times of the tide ; also a fine settlement, near which a small English church has been recently erected.

HOLLAND COVE is $1\frac{3}{4}$ miles farther to the southward, and also on the western shore. The anchorage off its mouth, although deep enough, is inconveniently small for large ships, but safe and good for small vessels. The best berth, for anything larger than a fishing schooner, is in 7 or 8 fathoms, mud bottom, with Pirate island bearing S.E. by S., and distant a cable's length.

Pirate island, small, rocky, and united to the mainland by a beach of shingle, forms the south-east point of Holland cove ; and all within it and a line drawn across to the wharves on the north-west side, is dry at low water, excepting a narrow boat channel, carrying 3 or 4 feet water,

which leads to the bridge across this cove about a quarter of a mile from its entrance.

The remaining anchorages in the Gut are less secure, either from exposure to particular winds, or loose holding ground. On the eastern shore, off Madden cove, and Doolan pond, north-west of Bear island, and east of Bear head, vessels frequently anchor to wait for wind or tide in fine summer weather; as they do also at Byers, Critchet, and Eddy coves, on the opposite side of the channel. There will be no difficulty in choosing a berth at any of these with the aid of the chart.

HABITANTS BAY, situated to the north-east of the south entrance of the Gut, is about $2\frac{1}{2}$ miles wide at the entrance, between Bear and Turbalton heads. In addition to Habitants harbour at its head, it contains the two following useful anchorages:—

Seacoal Bay, on the western shore, and $1\frac{1}{2}$ miles from Bear head, will be readily known by the high cliffs of Carleton head, which forms its north-east point. This spacious anchorage, secure in all winds excepting those from between South and S.E., is very convenient for vessels bound in through the Gut, and detained by strong north-west winds. The depth in the mouth of the bay is 5 fathoms, the bottom of mud, and there is no danger in the way.

Turbalton Bay, opposite to, and distant 2 miles from the last, is a small but secure anchorage, to the northward of Turbalton head, and between it and Evans island. In approaching this anchorage, the only danger to be avoided is the reef off Turbalton head, which is partly dry at low water, and runs out $2\frac{3}{4}$ cables to the westward. Janvrin and Peninsula points in one, bearing S. by E. $\frac{1}{2}$ E., or the two extreme points on the western side of Evans island in one, bearing N.N.E., will just lead clear to the westward of this reef in $4\frac{1}{2}$ fathoms. There is no other danger in the way, excepting the shallow water extending from the shore on either side, and from the small islets in the bottom of the bay. To avoid the latter, in a vessel of large draught, go no farther in than the line of Turbalton head and Cape Argos touching, where the depth is $4\frac{1}{2}$ fathoms at low water. With the cape a little open to the westward of the head the depth is 5 fathoms; in either case the bottom will be of mud, and the reef will break off the swell from the southward.

Habitants Harbour is not at present much frequented, being out of the line of general navigation; but it has space and depth of water sufficient for a large number and any class of vessels, and is quite secure at all seasons. The southern side of the harbour is formed by islands enclosing the Basin, in which vessels might securely winter, but of which a minute account would only confuse a stranger. Referring therefore to the exact graphical representation in the Admiralty chart, as far superior to any written

description, it is only necessary to remark, that the channel leading into the harbour, between Long ledge and Evans island, is nowhere less than $1\frac{1}{2}$ cables wide from 3 fathoms to 3 fathoms on either side, and carries 10 or 12 fathoms water with mud bottom.

Habitants river enters the harbour from the north, and is navigable for vessels by a narrow and winding channel for several miles, while boats can ascend to the bridge, a distance of 7 miles. There are some good farms on the banks of this river; but the shores of the harbour are as yet very thinly settled, and present a very barren appearance. There is said to be workable coal at Little river just outside the harbour's mouth.

DIRECTIONS.—To avoid Long ledge, which is distant about 3 cables from Evans island, and to run into Habitants harbour far enough for safe anchorage, proceed as follows :—

Approaching from the south-west through Habitants bay, and with a leading wind, steer so as to pass the west end of Evans island at a distance between $1\frac{1}{2}$ and 2 cables, or by the lead in 6 fathoms water; remembering that the bank on either side is very steep for vessels drawing more than 10 feet water. Follow the shore of the island round to the north-east, but approaching it at the same time very gradually, so as to pass Steep head, its northern extremity, at the distance of 1 or $1\frac{1}{2}$ cables. Having passed Steep head, the vessel will be in safe anchorage, but she may go farther in without danger, by simply keeping in mid-channel as she runs towards Bumbo island, which will be seen (small, round, with low clay cliffs) bearing E. $\frac{1}{2}$ N., and distant nearly a mile from her track while passing Steep head as just directed.

As the vessel proceeds, the channel between Round and Freeman islands, leading into the Basin, will be passed; and when she has arrived within a third of a mile of Bumbo island, the main channel between it and Indian point, and leading into the harbour to the north and east, will appear open, as well as the entrance of Habitants river, the entrance to which lies three-quarters of a mile to the northward. The shallow water extends one cable off Bumbo island, and the main channel, which, passing to the north-west of it, leads into the wide expanse of the harbour to the eastward, may be followed without difficulty with the aid of the chart. It is, however, not necessary to go beyond Bumbo island for good anchorage, as that may be found everywhere in the channel; and if the depth of water there be considered inconveniently great, the bight to the southward of Bumbo island, between it and Freeman island, affords a good berth in a moderate depth of water.

TIDES.—It is high water, full and change, in Habitants harbour at 8h. 20m.; the rise in ordinary springs being $6\frac{1}{2}$ feet, and in neaps $4\frac{3}{4}$ feet.

The tides in this harbour are weak, seldom exceeding a knot in the entrance, where they are strongest.

DIRECTIONS for the GUT of CANSO.—With the foregoing description of the dangers and anchorages, and the aid of the chart, there will be little or no difficulty experienced in the passage of the Gut of Canso, either with a leading or a beating wind. In the latter case, and when bound to the northward into the Gulf, the aim should be to gain the anchorage at Plaster cove, and to start from thence with the turn of the tide, so as to secure a good offing in George bay before the ebb makes.

When bound through the Gut to the southward, the course from Cape George to the light (page 133) at the north entrance of the Gut, is S.E. $\frac{3}{4}$ S., and the distance $20\frac{1}{2}$ miles. The approach in this direction, through George bay, is unattended with difficulty or danger, excepting when fogs or snow-storms hide from view the light which has been judiciously placed at its northern entrance. The soundings are then the only guides, and they will be found sufficient, in all ordinary cases, for the safety of vessels prudently conducted, with their leads going, and furnished with the Admiralty charts. In vessels so circumstanced, the endeavour should be to strike soundings on the bank off Long point, and then to follow its edge along the shore of Cape Breton island, in the low water depth of 10 fathoms, to the entrance of the Gut. It is seldom so thick, especially in a breeze of wind, but that some part of the shore will be seen before the vessel has run far after entering so narrow a strait. With a beating wind, she should board off and on the same shore, until soundings are struck (in the board to the westward, and after crossing the deep water), on the edge of the bank off Cape Jack, where, if it be night, and the fog so thick that the light cannot be seen, or if the tide be nearly done, it will be advisable to anchor, and wait for a change. The ground there is not good, but it is out of the strength of the tides, and an anchor will hold in moderate weather. The anchorage half a mile to the south-east of the lighthouse, and on the same side of the channel (page 133), should be preferred if attainable: there are some spots of mud there, in which an anchor holds well in from 7 to 9 fathoms, and where the strength of the tide is not great.

Vessels outward-bound, and proceeding through the Gut to the southward, very frequently meet a south or south-east wind, with its usual accompaniments of fog and rain; in which case the roadstead off Ship harbour will be found the most roomy and convenient anchorage. Eddy cove, from its more advanced position at the entrance of the Gut, offers, to vessels sailing with the first of a fair wind, a better chance of clearing Chedabucto bay and the Canso ledges before dark; but it can only be

recommended in fine settled summer weather, for the ground is not good, and the anchorage is much exposed on the occurrence of a sudden change of wind. Turbalton bay is much more secure, but it is rather small for a large and weakly manned vessel to weigh from, in the event of a strong wind setting in suddenly from the westward.

TIDES.—It is high water, full and change, at the north and south entrances of the Gut of Canso, at 9¼h. and 8h. respectively. The rise at each, in ordinary spring and neap tides, is 4½ and 3 feet; but extraordinary tides may rise 6 or 7 feet, or only 2 feet, owing to the irregular influence of unknown causes; probably strong winds at a distance. The rise and fall of the tides on the shore usually continue through nearly equal periods of time, but the duration of the tidal streams (the flood being to the northward and the ebb to the southward) varies from one to four hours after it is high or low water by the shore, even in the fine weather of summer; whilst in the blowing weather, so frequent on the approach of winter or in early spring, they are reported to be still more irregular, running at times in the same direction for several days in succession; but this never occurred during the Admiralty survey.

The rate of these streams off Cape Porcupine, where it is most rapid, is ordinarily about 4 knots; but is increased occasionally to 5 knots by strong winds. At most of the anchorages, and under almost every point, there are eddies, usually running in the opposite direction to the main stream outside, but at a much inferior rate; and they render great attention necessary to ensure a clear anchor.

The set of the flood stream from the north entrance of the Gut is nearly towards Cape George, diminishing rapidly in strength as it expands in advancing to the northward. It is weak in the western part of George bay, sweeping round it to the north-west, with slight indraughts towards Pomquet, Antigonish, &c. The ebb stream will be found setting in the contrary direction.

On the eastern side of George bay, the flood stream from the Gut is usually met by a much weaker and contrary stream of flood, coming from the north-east, along the west coast of Cape Breton. These opposing flood streams will be found, in general, to unite somewhere off the Judique shoals, and then to set towards the north-west. The two corresponding ebb streams as generally diverge from about the same place; the one setting towards the Gut, with increasing strength, as it proceeds to the southward; and the other in the contrary direction, towards Port Hood. All, however, that has been said respecting these streams must be understood as of usual, and not of constant occurrence, since they must necessarily partake of the irregularity in the strength and duration of the tidal streams of the Gut of Canso. Nevertheless, it will be highly useful, and

may materially aid the progress of the vessel, to bear in mind the *usual* set of these streams.

LENNOX PASSAGE.

Lennox passage, between Cape Breton island and Janvrin and Madame islands, is very intricate, and 15 miles in length, with a low-water depth of 18 or 19 feet in the shallowest part. There are seldom less than 23 feet at high water, nevertheless a great part of the channel is so narrow, crooked, and full of shoals, that it would require to be well buoyed before it could be safely navigated by large vessels.*

It is, however, a safe and convenient channel for coasting vessels; avoiding the heavy swell in Chedabucto bay, and affording them an advanced anchorage, from which to start with a fair wind when bound out to sea. These vessels, usually not exceeding the draught of 10 or 12 feet, frequently run through with a leading wind, choosing their time of tide; but large vessels seldom attempt it, even with the assistance of some persons there who profess to act as pilots, but whose knowledge of the channel is far from perfect. It will be enough to notice very briefly the intricate parts of the channel; a written description would avail but little, and be far less effectual than a faithful representation afforded by the chart; but for some distance in from either entrance the Passage is not so difficult, and as a knowledge of the anchorages there may often prove highly useful to vessels desirous of shelter on the approach of bad weather, those places will now be described.

The WESTERN ENTRANCE of Lennox passage, between Rabbit and Janvrin islands, is a mile wide, but the navigable breadth is reduced to half a mile by the Macdonald shoal, a bed of rocks, with 5 feet least water, and extending nearly three-quarters of a mile along the northern shore of Janvrin island, from which it is separated by a narrow and shallow channel. This dangerous shoal, as well as the reefs off Turbalton and Thomas heads (see pages 146, 150), must be carefully avoided in entering the Passage. The west end of the shoal is distant half a mile N.N.E. from Thomas head, which in line with Janvrin point will just lead clear of it to the westward. These marks are distinct and good; but when they are in line, it may be observed that a small part of Wasting islet will be seen to the westward of Janvrin point, and must not be mistaken for it. In standing towards the shoal, keep the last named point in sight, and there will be no danger. The mark for clearing the north side of the shoal is the high water sand beach of Strawberry point kept open of Macrea point, bearing E.S.E., but it is not very clearly defined, and therefore on

* *See* Chart of Lennox Passage, No. 2,756; scale, $m = 2$ inches.

that side the shoal should be approached with great caution, and no nearer than the low water depth of 6 fathoms.

ANCHORAGE.—The anchorage in this entrance of Lennox Passage is spacious and secure, in from 5 to 7 fathoms, anywhere to the northward of the Macdonald shoal ; but the best berth is off Cary passage, at the east end of Rabbit island, in 7 fathoms, mud, and where the main channel is a mile wide and free from danger. It is only necessary to observe that the shallow water extends a cable's length off the south shore of Rabbit island, and 2 cables off the east point of entrance of Cary passage, where there is a rocky patch, with 10 feet least water $1\frac{1}{2}$ cables off shore.

DIRECTIONS.—Entering Lennox Passage from the westward, Campbell island will be seen from the anchorage just mentioned, and at the distance of $1\frac{1}{2}$ miles to the eastward. The navigable breadth of the Passage is there reduced to 3 cables by Fish shoal, which is rocky, with 10 feet least water, and lies a quarter of a mile off a small cove of Cape Breton island. From thence the Passage becomes intricate ; the following leading marks, with brief directions, will enable any person, who can recognize the objects named, to take a vessel through with a fair wind :—

Before arriving at Fish shoal, open out Burnt point a little to the southward of Low point, bearing E. $\frac{1}{4}$ N. ; keep them so, and they will lead to the southward of that shoal, and for a mile farther to the eastward. When Thorn island is just about to disappear behind Glasgow point, bearing S.S.W. $\frac{1}{4}$ W., alter course, and steer E.S.E., or towards Martinique cove, where there are several houses, until Burnt and Seal islands close and appear to touch, when they will bear E. $\frac{1}{2}$ N. These last named points kept exactly touching, will lead through between the shoals as far as Burnt point, where the channel turns to the north-east, between that point and the Burnt islands, and where the deep water is only half a cable wide. Passing midway through this narrow opening, and with the aid of the chart, rounding the Burnt islands to the north and east, steer S.E. between them and Seal island, until the eastern point of Burnt island comes in one with Heron point, about W. by S. $\frac{1}{4}$ S. ; then alter course instantly to E. by N. $\frac{1}{4}$ N., keeping the last named points astern and exactly touching, and they will safely lead through between the Middle ground and Seal island, where the channel is again only half a cable wide.

The Middle ground is rocky, with 4 feet least water ; and when the channel between it and Seal island is fairly entered, steer half a point more to the northward, E. by N. $\frac{3}{4}$ N., or so as to keep Heron point only just shut in behind the eastern point of the Burnt islands, until Grande-digue point (the *land*, not the shingle-spit) and Hawk islet are touching, and bearing of E. by S. $\frac{3}{4}$ S. Now keep to these last-named marks, and

they will lead to the excellent anchorage off the ferry at Grande-digue, where there is room enough for the largest ships in from 5 to 8 fathoms, mud bottom. The long spit of shingle, from which the name is derived, runs out from Grande-digue point, nearly 2 cables across the channel, to about N.E. by N., and shelters the anchorage completely from the eastward. A great part of the spit is covered at high water, but can generally be discerned by the rippling of the tide. At Grande-digue there are extensive gypsum quarries, several tolerable farms, and the ferry by which the mail crosses the Passage, on its way to Arichat.

The only other danger here is the Ferry reef, which lies to the northwest of the spit, leaving a deep and clear channel 2 cables wide. This reef is nearly dry at low water, and very much in the way here, as it may be said to extend half way across the Passage, being separated from the northern shore by a channel so narrow as to be only navigable by boats or very small craft. On the southern edge of this reef, and also on the northern extremity of Grande-digue spit, Birch and Ouetique islands are just touching, and bearing of E. $\frac{1}{3}$ S.; and therefore, to clear the reef, keep Ouetique island *open;* and to clear the spit, partly *shut* in behind Birch point.

The ship channel, after passing to the southward of the Ferry reef, turns to the north-east, between it and Grande-digue spit, and then round the latter to the east and south, forming a crooked, and, for a stranger, a difficult pass.

With a beating wind, an intimate knowledge of the place and of the set of the tides is indispensable; but to run through the Narrows at Grande-digue to the eastward, with a fair wind, proceeds as follows:—Approaching the anchorage at Grande-digue from the westward, steer for Grande-digue point and Hawk islet touching, as already directed, until the south point of Cascarette island opens out a very little to the southward of Birch island; and then East, on this last named mark, which will lead well clear of the Ferry reef; and when the Tickle channel to the westward of Birch island comes open, and bears to the northward of N.E., steer towards it, until the southern extremity of Ouetique island is seen over the beach of Birch point, bearing E. $\frac{1}{2}$ S. Run towards the last named marks till Grande-digue spit is passed, which will be when the west end of Birch island bears North; then alter course instantly to S.S.E., or so as to make a direct course towards the middle of the western entrance of Poulament bay, and continue on that line until the north ends of Crow and Eagle islands come in one; then East towards Ouetique island until the steeple of the chapel at Discousse is in line with the north-east point of Hawk islet; and lastly, E.S.E., or so as to pass Hawk islet at the distance of 1 or $1\frac{1}{2}$ cables. The vessel will then have arrived at the com-

paratively wide and open part of the Passage off the eastern entrance of Poulament bay (see page 160), where she may anchor or proceed to sea with the aid of the chart, the following description of the dangers, and the directions at page 161.

By following the directions just given, the vessel will have taken the ship channel round to the southward of Birch shoal, which lies $1\frac{1}{3}$ cables S.W. by W. of Birch point. Not less than 13 feet were found on this shoal; but as boulders may occasionally be dropped upon it by the ice, or a small point of rock might possibly, although not probably, have escaped discovery, it will be best to follow the example of the country vessels, and avoid running over it. To the eastward of Hawk island the passage becomes much wider, and is navigable for the largest ships; but as the main object of these directions is to guide vessels into a safe anchorage, the order of description will now be reversed, and given as the objects would appear in succession from east to west to a stranger running in from seaward.

The EASTERN ENTRANCE of Lennox passage, between Cape Round and Mark point, is $2\frac{3}{4}$ miles wide. The shoals off St. Peter bay occupy much of that space, but still leave a clear channel a mile wide between them and Cape Round. As this channel leads to the only anchorages (either off the north side of Bernard island, or off the eastern entrance of Poulament bay, page 161), which a stranger could venture to run for, on the approach of bad weather in this very dangerous neighbourhood, an accurate knowledge of it becomes of considerable importance.

HORSEHEADS SHOAL, on this north side of the channel, is rocky, irregular in shape, and of great extent, and the outermost danger off St. Peter bay. Besides several shallow patches occasionally shown by breakers, there are three rocks near its northern side which only just uncover in low tides, and on which the sea usually breaks heavily. These were formerly known by the name of the Three Stones. On the north point of this shoal, in 18 feet water, the northern faces of Cascarette and Ouetique islands are in one, bearing W.N.W. Its western side will be cleared in 5 fathoms, if the *beach* of Beak point be not opened out to the eastward of Cape Round. The south side of the shoal is most in the way of vessels running in from the sea, and is just cleared by bringing the south-west extremity of Ouetique island and Savage point in one, when Cascarette island will appear just open to the south-west of them, and bearing N.W. $\frac{3}{4}$ W. If Savage point cannot be clearly made out, take care to keep Cascarette island open 2 degrees at least to the south-west of Ouetique, and to keep the lead going; remem-

bering also that there can be no occasion to approach this dangerous shoal nearer than the depth of 10 fathoms, as the channel between it and Cape Round is a full mile wide and carries from 5 to 19 fathoms water.

With the aid of the chart, there will be little difficulty in distinguishing Ouetique and Cascarette islands by a vessel entering this channel. They lie 4 or 5 miles to the north-west of Cape Round, and will be seen towards the Cape Breton island shore. Ouetique, especially, is very remarkable, being small, precipitous, dark-looking, comparatively high (about 50 feet), and with a few pine trees upon it; and Cascarette is the next island to the westward of it, much larger, not so high, wooded, with low cliffs at its north-east, and a sandy point at its south-west extremity.

SAMSON ROCKS lie North half a mile from the Horseheads, and nearer the mouth of St. Peter bay, bearing from Mark point W. by S. $\frac{1}{2}$ S. nearly three-quarters of a mile. Two of these rocks dry at low water, and have a considerable extent of shoal around them. The north points of Cascarette and Ouetique islands in one, lead to the northward of them, in $3\frac{1}{2}$ fathoms. They may be safely approached by the lead, referring to the soundings in the chart.

ST. PETER BAY,* which is 2 miles wide, opens immediately to the northward of the Samson rocks and of the Horseheads shoal, and may be approached either east or west of those dangers. It has excellent anchorage for any class of vessels, especially at Grande-grève on its eastern shore; but it is rendered almost inaccessible by the numerous rocky shoals scattered over the bay, and which could scarcely be avoided in a vessel of large draught without the assistance of buoys. Vessels not exceeding 10 or 12 feet draught may run in without difficulty, with the aid of the chart, on which they must rely, for no directions would avail in so intricate a place.

The principal settlements are at Grande-grève and along the south side of Jerome point, a high headland projecting from the north-east side of the bay; and rising to the summit of Mount Granville, on which the remains of an old fort may be seen, 190 feet above the sea. Vessels usually anchor in the north-east corner of the bay, within Jerome point, where there are the remains of another old fort, and a wharf at the Haulover, across to the Bras d'or Lake.

On the north side of the Haulover there is a wharf at the ship-building establishment of Mr. Handley, and there is also a post-office.

A canal has been more than once proposed at this place, and will probably be formed at no very distant day. A survey has been made

* Formerly Port Toulouse.

for it by Mr. Wm. Fairbanks, an intelligent civil engineer of Nova Scotia. The distance across the neck of land is 2,400 feet; its greatest height, extending only for a small part of the distance, 45 feet, and the cutting easy. The advantages of such a canal to the numerous vessels engaged in the coal trade to and from the Sydney mines would be great, as they would thus be enabled to substitute for the long and comparatively dangerous circuit by Scatari, a short and safe route through the Bras d'or. Scarcely less would be the benefit it would confer upon the settlers along the shores of the Bras d'or, by opening for them a way to markets for agricultural produce at Arichat, Canso, and other places where the fisheries are almost exclusively prosecuted.

BOURGEOIS INLET.—Crossing the mouth of St. Peter bay, several remarkable cliffs of red clay will be seen immediately to the westward of it: the westernmost of them are on Bisset island, which forms the east point of the narrow entrance to Bourgeois islet, an extensive arm of the sea, with 12 feet at low water in its mouth. The stores and wharves at Mr. Bisset's establishment, and the chapel on the east side, a short distance within the entrance, will point out this place to strangers. The fisheries, ship building, and as yet limited agriculture, give employment to a number of people, principally Acadians, who are settled around the inlet.

OUETIQUE and CASCARETTE ISLANDS.—Ouetique island, already described (page 158), lies one mile to the south-west of this inlet; the passage between them is full of dangers, amongst others, the Philip rocks which are almost always uncovered.

Cascarette island lies a long half mile to the westward of Ouetique. The shallow water does not extend farther than a cable's length from the south point of either of these islands, but there is a half-tide rock between them, from which shoal water extends 2 cables to the south-west.

The proper passage here, is between Cascarette and Bernard islands, and three-quarters of a mile wide; but in the middle lies a *rocky bank*, with 18 feet least water, which contracts the deep water channel to the southward of it, to 2 cables in breadth.

GOILLON REEF lies half a mile farther to the north-west, and about the same distance W.S.W. of Cascarette island, leaving a clear channel into the extensive inlet of Couteau, off the mouth of which it lies. This reef dries at half-tide. The marks for leading to the southward of it, and likewise the 18-feet rocky bank just mentioned, is to keep Moulin point open to the southward of Birch point, bearing W. by N. $\frac{1}{2}$ N.

INDIAN CREEK and COUTEAU INLET.—The common entrance to Indian creek and to Couteau inlet is seven-eighths of a mile wide between

Cascarette island and the east end of Birch island. The inlet runs in 3 miles to the north-west, and is navigable for large vessels.

BIRCH ISLAND forms the north side of the main passage for the remaining distance of a mile, to Grande-digue, in which interval the only detached danger is Birch shoal, off Birch point, noticed in page 157.

CAPE ROUND the southern point of the eastern entrance of Lennox Passage, is a remarkable cliff of red clay 60 feet high, forming the north-east point of Madame island. The shallow water, which here runs off only a quarter of a mile, widens in proceeding to the north-westward past the long shingle beach of Goulet, and for a large vessel must be considered continuous to the north-east extremity of the Gabion shoal, distant 2 miles N.N.W. from Cape Round.

GABION SHOAL is rocky, and the least water, 5 feet, is on the Morris rock, near its north-west angle. The shoal is three-quarters of a mile in length, and so lies across the extremely intricate anchorage called the Goulet, that small craft only can pass between it and Goulet beach, from which it is distant three-quarters of a mile to the northward.

The marks for leading to the eastward of the eastern end of this dangerous shoal, together with the shoal water off Goulet beach, are the chapel steeple at Bourgeois inlet and the eastern point of Bisset island in line, bearing N. by W. $\frac{1}{2}$ W. ; Cascarette and Ouetique islands touching and bearing N. W. by W., clear its north-east point ; and Eagle and Bernard islands touching, and bearing W. $\frac{3}{4}$ N., will lead clear along its north side, but must not be followed much beyond it because of the Discousse shoal, which is separated from the Gabion shoal by a channel only a quarter of a mile wide. This channel, which carries 8 or 9 fathoms water, leads towards the Goulet anchorage, which, as above mentioned, lies to the westward of Goulet beach, and which is accessible to small vessels only through narrow channels between the shoals.

DISCOUSSE HARBOUR.—The Discousse shoal extends half a mile to the eastward of Bernard island, and stretches across to Gabion point, so as to form the bar of Discousse harbour. It is rocky, with 3 feet least water, and to clear its north point, which is much in the way, keep Poulament islet and Bernard island touching, and bearing West.

Discousse harbour is formed by Bernard island, the several parts of which, united by beaches, extend for nearly a mile along the shore of Madame island. The entrance from the eastward is by a very narrow channel, with 7 feet in it at low water, and passes close to the flag-staff, stores, and wharf at the north-west extremity of Gabion point.

The steeple of the chapel, and the other buildings of the village on the

shore opposite the island, will immediately point out this place to strangers. It is a secure and very pretty little harbour for the small vessels by which the fisheries are extensively prosecuted, and generally belong to Jersey merchants residing at Arichat.

POULAMENT BAY is a secure and capacious harbour, with three entrances formed by Eagle and Crow islands, which lie nearly in a direct line from Bernard island to Grande-digue, a distance of 2 miles to the westward. Poulament islet, small, low, round, and wooded, lies within Eagle island, and, together with the shallows, divides the bay into two parts, of which the eastern division, leading to Poulament creek, containing most of the houses, and affording the most roomy anchorage, in 4 or 5 fathoms, with mud bottom, is the most frequented. An equal depth might be carried into the bay if the channel were buoyed, but the shoals extending in opposite directions from Bernard and Eagle islands so overlap as almost to form a bar, over which from 13 to 17 feet, according as it may be low or high water, are all that can be ensured to a stranger, running in with the leading marks astern; namely, Cascarette island and Cordeau point, touching and bearing N.E. $\frac{1}{2}$ N. Vessels drawing too much water, or not wishing to run in, may safely anchor in the roadstead outside the bar.

Hawk islet, united at low water to the east end of Eagle island, and distant three-quarters of a mile W.N.W. from Bernard island, forms the north-west point of eastern entrance to Poulament bay; it is bold to the northward, but to the eastward a shoal runs off towards Bernard island to the distance of 2 cables. In the remaining distance, of $1\frac{1}{4}$ miles, to Grande-digue, the principal dangers in the way are, the shoal which runs out, E. by N., a quarter of a mile from Crow island, and which is cleared by bringing the north point of Hawk islet and the chapel steeple at Discousse in line; and the Birch shoal, already described in page 157.

DIRECTIONS.—To the foregoing brief description, which should be read with reference to the Admiralty charts, the following directions are added for the use of vessels desirous of shelter on the approach of bad weather; and especially at the commencement of winds from between the South and East, as they seldom continue beyond a very few hours without bringing thick fog and rain. In a vessel so circumstanced, and approaching the Lennox Passage from the south-east, proceed as follows:—

Pass Cape Round at any distance between half and three-quarters of a mile, steering N.N.W., until Ouetique and Cascarette islands touch; then steer towards those islands, N.W. by W., or so as to keep them touching, until Poulament islet appears just open to the northward of Bernard island; and then West, or towards the last-named marks, keeping the

islet just open until the steeple of the chapel at Bourgeois islet comes in line with the eastern point of Ouetique island, bearing N.E. The vessel will now be in about 9 fathoms, with mud bottom; and if she bring up with the last mentioned marks on, will be distant a long cable's length from the shallow water off the north side of Bernard island, and in safe anchorage, being sheltered from south-east winds by the Discousse and Gabion shoals, and by land in every other direction.

If the anchorage off the eastern entrance of Poulament be preferred, then instead of anchoring, when the steeple of the chapel at Bourgeois inlet and the eastern point of Ouetique island come in line, alter course to W.N.W., or as may be found necessary to open out the north point of Crow island, a little to the northward of Hawk islet. Having done so, run towards them, W. by N., until the steeple at Discousse comes in one with the *high water* western extremity of Bernard island, when the vessel will have arrived within 1 or $1\frac{1}{2}$ cables of her anchorage. Continue the W. by N. course until Poulament islet and Eagle island close, and when they touch, bearing W. by S., Cordeau point will either be touching, or only just shut in behind the western end of Cascarette island, bearing N.E. $\frac{1}{2}$ N. Round to, to the southward, with these last named marks on, and bring up, either in 7 fathoms, with the northern extremities of Crow and Hawk islands in one; or a little farther in with the two points on the north side of Bernard island in one; there the depth will be 6 fathoms, and the bottom in both places mud.

If the vessel does not draw more than 13 feet water, she may safely run into Poulament bay, by keeping the leading marks on astern as she runs from them (namely Cordeau point and Cascarette island, touching, or very slightly open, and bearing N.E. $\frac{1}{2}$ N.), and when the south side of Crow island appears in sight to the southward of Eagle island, she will be within the bar, and may bring up in $4\frac{1}{2}$ fathoms, mud, and in quite a secure harbour.

With the Admiralty chart, and in the hands of the seaman locally acquainted, there would be little difficulty in taking a vessel of large draught to the anchorage at Grande-digue; but written directions would avail but little in such a narrow and difficult channel, where there are neither buoys nor beacons, and where the least mistake in making out the objects named as leading marks would almost instantly run her on shore.

TIDES.—It is high water, full and change, at Grande-digue in the Lennox Passage, at 7h. 55m.; ordinary springs rise $6\frac{1}{3}$ feet, and neaps $4\frac{1}{2}$ feet. The tidal streams are often irregular, but when not so, change about three-quarters of an hour after high and low water by the shore; the flood coming in from the eastward, they are stronger round the spit

at Grande-digue than in any other part of the Passage, but their rate even there seldom exceeds two knots.

In the entrance of Poulament bay the time of high water is 7h. 50m., and in St. Peter bay 7h. 30m.; springs rise 6 feet, and neaps 4 feet. The tidal streams are weak in Poulament bay, and seldom exceed a knot in the channel off its mouth.

The mean level of the Bras d'or Lake, at the Haulover, was found to be rather more than 2 feet below the high water of ordinary spring tides in St. Peter bay, but the influence of the tides is imperceptible in that part of the former, though winds cause a fluctuation of level to the amount of about 2 feet.

CHAPTER XXI.

CHEDABUCTO BAY.

VARIATION 22°½ West in 1860.

CHEDABUCTO BAY, through which all vessels entering or leaving the Gulf of St. Lawrence by the Gut of Canso must pass, is 17¼ miles wide at the entrance, from Michaux point to the lighthouse on Cranberry island ; but the entrance is generally considered to lie between Green island and the Canso ledges, in which case the breadth is only 7½ miles. The whole depth of the bay, from the easternmost of the Canso ledges to Guysborough, is 26 miles. The following description of its shores, with the dangers, anchorages, and harbours on either side, is given from east to west, or as they would be passed by a vessel running in from sea.*

MICHAUX POINT, the north-east point of Chedabucto bay (in some charts Cape Hinchinbroke, in others Peninsula point, names unknown to the inhabitants), is a peninsula, united to the mainland by a double beach, inclosing a pond ; and Red point and Red island are distant from it 2¼ miles to the W.N.W. Off these points, and extending across the bay between them, lie the Michaux ledges, dry at low water, and usually shown by heavy breakers. Lying nearly a mile from the shore, with deep water close to them, they are extremely dangerous in dark nights or foggy weather. The south-west extremes of St. Peters island and Mark point in one, lead close outside or to the southward of them, in 4 fathoms ; therefore, in standing towards them, tack while the point is well open to the west of the island.

St. Peter island lies 3½ miles farther to the N.W.; and in the shoal bay between it and Red point will be seen the church steeple and the village of Ardoise. The island is low and about three-quarters of a mile long. The cove on its inner or north side affords shelter to numerous small craft and boats, this being one of the principal fishing stations in these parts. The island is bold to seaward, but off its north-west side is the Haddock

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* *See* Chart :—Gut of Canso and Chedabucto Bay, No. 2,342 ; scale, *m* = 1 inch.

rock, at a distance of a quarter of a mile ; and in the bay between it and Mark point there is much shoal water, leaving, however, a clear channel within the Horseheads and Samson rocks into St. Peter bay (page 158). The distance across the eastern entrance of the Lennox passage from St. Peter island to Cape Round, is $3\frac{1}{4}$ miles W. $\frac{1}{2}$ N.

BEAK POINT.—All objects of importance on the north side of Madame island having been noticed in the preceding chapter, the eastern and southern shores will now be described, commencing at Beak point, distant $1\frac{1}{4}$ miles S.W. by S. from Cape Round. The shoal water runs out from Beak point only to the distance of 2 cables, but off it there is much rocky and irregular ground, on which the sea is said to break occasionally in heavy gales. The least water that could be found there was 4 fathoms, which bears from the point S.E., and is distant $1\frac{1}{2}$ miles. Another rocky patch, with $4\frac{1}{2}$ fathoms, lies E. by S. a mile from the point. A vessel of large draught should pass outside this rocky ground, especially when there is a heavy sea running.

BAY of ROCKS, lying between Beak point and the Grosnez, a rocky islet at the north-east extremity of Petitdegrat island, is 3 miles wide, and deep. It is a dangerous place, affording no safe anchorage for ships, being open to all easterly winds, which send in a heavy sea. Bewes shoal, with 21 feet least water, lies nearly in the middle of the bay, and besides the low Rocky islets near its head, there are many other rocks around and off its shores.

Red head, the south-east extremity of Petitdegrat island, is a remarkable cliff 70 feet high. Shallow water runs out from it a quarter of a mile, to clear which, keep Beak point open to the eastward of Flat point.

GREEN ISLAND and ORPHEUS ROCK.—Green island, of slate, with precipitous shores, 90 feet high and a third of a mile long, lies a mile to the S.E. of Red head. It is bold all round, and there is a clear channel three-quarters of a mile wide between it and Red head.

The Orpheus rock (called Boss by the fishermen) lies E.S.E. $1\frac{2}{3}$ miles from Green island. It is awash at low water, and the sea consequently almost always breaks on it ; otherwise it would be still more dangerous than it is. It is small, with deep water all around. At the distance of only one cable to the south-west of it the depth is 50 fathoms. Heath head (the southern extreme of Petitdegrat island, and distant a mile West from Red head), will lead clear of this rock, either to the northward or southward, according as it may be kept open to the north or to the south of Green island.

PETITDEGRAT INLET, separated from Madame island by a very narrow channel, through which boats may pass at high water into the Bay of Rocks, is 3 miles long, and has water enough for large vessels; but the rocks are so numerous and the channel between them so narrow as to render the aid of a native pilot indispensable. The fisheries are extensively prosecuted from this inlet; and its shores, as well as almost every cove in the island, are occupied by the fishermen and their employers.

Cape Hogan, the southern promontory of Madame island, separates Petitdegrat from Arichat, and is a bold and remarkable headland, with cliffs 100 feet high.

CERBERUS ROCK, just awash at low tide, with deep water all around, and lying directly in the way of vessels to and from the Gut of Canso, is exceedingly dangerous in dark nights and foggy weather; in the daytime either breakers or a rippling over it can almost always be seen. It bears from Arichat head, the nearest land, S.S.W. $2\frac{1}{2}$ miles; and is rather more distant from Jerseyman island, on a W.S.W. line of bearing.

DIRECTIONS.—Cape Hogan and Green island in one, bearing E. by S. $\frac{1}{4}$ S., will lead clear to the southward of the Cerberus at the distance of 4 cables; Arichat church steeple and the eastern extremity of the *western* peninsula of Jerseyman island in line, E. by N. $\frac{1}{2}$ N., will lead a cable to the south-east; Carleton head, open to the westward of Wasting islet, or Eddy point and Ship point in one, will either of them lead a mile to the westward; but those objects are too distant to be often clearly distinguished, therefore, to avoid this danger in a vessel bound to the westward, keep some part of Green island in sight to the southward of Cape Hogan until the easternmost church at Arichat is seen over the shingle isthmus uniting the two peninsulas of Jerseyman island, or until Arichat head bears N.E. by N.; then the course may be safely shaped direct for the Gut of Canso.

In a vessel outward bound, take care that the course made good from the middle of the southern entrance of the Gut of Canso is not more to the eastward than S.S.E. until Green island appears to the southward of Cape Hogan; or until the steeple of the above church is seen over the Jerseyman isthmus, when the course may be safely shaped more to the eastward and out to sea.

☞ **ARICHAT HARBOUR.**—This spacious and secure harbour, capable of containing any number of the largest ships is sheltered by Jerseyman island, which stretches across the bay. It has two entrances, of which the western is the least difficult for strangers, although only a cable wide.

The straggling but well placed town of Arichat extends nearly 3 miles

along the bold and steep north shore of the harbour, where there are many wharves and stores. Of the two churches the westernmost is the largest; and the only other public building at all remarkable is the court-house, standing more to the eastward, and distinguished by its cupola.

Arichat is the head quarters of the fisheries in its neighbourhood, and the most important seaport, both in commerce and in population, on the Atlantic coast of Nova Scotia eastward of Halifax. The population of the town and of the immediate vicinity in 1850 was estimated at 3,000, and that of the whole of Madame island at 5,000.

Slates, sandstones, conglomerates, and traps, probably upper silurian rocks, predominate around Arichat; and the country has a sterile appearance, arising as much from the neglect of agriculture as from the nature of its soil or its unfavourable climate. Here, in common with every other part of the Atlantic coast of Nova Scotia and Cape Breton island, vegetation is retarded in a much greater degree than on those parts of the same colonies that are situated within the Gulf of St. Lawrence, by the easterly winds, which usually prevail in May and June, and bring rain and fog from a cold and frequently icy sea.

Water.—The usual watering place is at a spring near Hubert's wharf, where good water may be obtained on payment of a small sum. Water may also be obtained at Irish point, from the outlet of the chain of small lakes in rear of the town.

LIGHT.—The lighthouse erected on Marache point, on the east side of eastern entrance to Arichat harbour, is a square, wooden, and white building, showing at 34 feet above the sea at high water a *fixed white* light, visible in clear weather from a distance of 8 miles.

Marache point is quite bold to the westward, with the exception of two small rocky patches which lie off it at the respective distances of 3 and 4 cables to the N.W., and on which the least water is 4 fathoms. To the northward of the point, and for some distance to the eastward, the shoal water extends $1\frac{1}{2}$ cables off shore.

The eastern entrance to Arichat harbour is 3 cables wide, but it lies between shoals which, with the other dangers and the marks for clearing them, must first be briefly described.

Hautfond Shoals are a chain of rocky patches. The least water, 10 feet, is on the outermost patch, from which Moyac point bears S.E. by E., and Marache point E. by N. $\frac{1}{2}$ N., and the distance is nearly a mile from each of them. The other patches lie in a line from the outer one to the north side of Forest cove; the least water on them is 21 feet, and there is deep water between them, but the safe channel for ships is outside or to the westward of them all. Cape Hogan and Green island in one, lead a third of a mile to the southward of these shoals; and Hubert's white

house and flag-staff seen over the eastern extremity of the cliffs of Jerseyman island, bearing N.E., will just clear their north-west side.

Capodiette Bay, $1\frac{1}{2}$ miles wide, between Marache and Kavanagh points, although open to westerly winds, and to the heavy swell rolling in at times round the point from the southward, nevertheless affords a tolerably good occasional anchorage in 10 or 12 fathoms, mud bottom; the best ground being in the deepest water.

Fiddle Shoal, with 10 feet less water, lies at the outer end of the rocky bank which extends W.N.W. 3 cables from Kavanagh point. There is no passage for large vessels between it and the point, which has several dry rocks off it, and shoal water all along its south-west side, to the distance of $1\frac{1}{2}$ cables off shore. On the north side of the point within the harbour, a reef, with only 3 feet at low water, runs off a quarter of a mile, which is half way across to the wharves of the town of Arichat. This danger must be carefully avoided when hauling to the eastward towards the head of the harbour.

Henley Ledges, which are black rocks, covered only at high water and almost always shown by breakers, lie on the opposite side of the eastern entrance to Arichat harbour, near the south-west extremity of the rocky bank off Jerseyman island, from which they are distant two-thirds of a mile. The breadth of the deep water between them and Marache point, from which they bear N.W. by W., is three-quarters of a mile. To seaward the shallow water extends from them only $1\frac{1}{2}$ cables, but there is a rock awash a third of a mile from them to the N.N.W. $\frac{1}{2}$ W.; and two others between them and Jerseyman island, thus leaving no passage for ships. There are no good leading marks for sailing to the south-west of these rocks; but vessels will pass well to the south-east of them, if the steeple of the easternmost church at Arichat be not shut in behind the eastern extremity of Jerseyman island.

Pilot Rock is on the north-west side of the channel, and at the extremity of the shallow water off the east end of Jerseyman island, from which it is distant 3 cables to the S.E. It is small, with 4 feet least water, and quite bold to the southward. There is no channel between it and the island for large vessels. The leading mark to clear it is De Carteret's flag-staff, near to the east end of Arichat, seen over Kavanagh point; but this mark leads very close to the south-east of the rock.

Poule Reef, with 7 feet least water, lies E. by N. 2 cables from Poule islet, which is nearly united to the east end of Jerseyman island at low water. There is a narrow channel, fit only for small craft, between the shoal and the islet; but the ship channel to the eastward of this shoal, between it and the Fiddle, is 3 cables wide, from the depth of 3 fathoms to 3 fathoms on either side, with water sufficient for the largest ships.

DIRECTIONS.—If bound to Arichat from the eastward, with a leading wind, that is, any wind from S.S.E., round south, to W.N.W., a vessel will pass the Hautfond shoals by keeping some part of Green island in sight to the southward of Cape Hogan, until the easternmost church at Arichat appears only a little open to the eastward of Jerseyman island, bearing N.E. by E. $\frac{1}{4}$ E. Having brought the church steeple on that line of bearing, steer for it, but keeping it a little open, until the light-house on Marache point bears S.E. by E., or until the Henley ledges are in one with Arichat head, the western extremity of Creighton island, bearing N.W. by N., and are distant a quarter of a mile. Then steer E. $\frac{1}{4}$ N., or so as to make a direct course towards Little Barachois at the head of Capodiette bay; and as soon as the steeple of the westernmost church at Arichat opens a little to the eastward of the minister's flag-staff, bearing North, run towards it until the southern extremity of Creighton island is seen through the Crid pass. The vessel being then within Poule reef, may safely haul to the westward, and select a berth at pleasure in the most roomy part of the harbour, anywhere to the north of the line from Poule islet to Beach point. South of that line the eastern bight of Jerseyman island contains the Cage shoal, with only 7 feet water, and much foul ground.

If the vessel should have occasion to go to the eastern part of the harbour, she should stand well over to the north shore before bearing up to the eastward, and run along it at the distance of a cable from the ends of the wharves, until after Marache point has disappeared behind Kavanagh point, when she will be to the eastward of the reef off the last named point, and will find bold shores and plenty of water to within $1\frac{1}{4}$ cables of the entrance of the cove at the head of the harbour.

The foregoing are safe and simple directions for a stranger in a vessel of large draught, but with an easterly wind it would not be desirable to run so far to leeward as would be required to bring the steeple of the easternmost church, in line with the eastern extremity of Jerseyman island; and for persons sufficiently acquainted with the place to be certain of distinguishing the leading marks, it would not be necessary. They could pass either outside of the Hautfond shoals, upon the leading marks given for clearing them to the north-west, namely, Hubert's house and flag-staff, shut in behind the eastern extremity of the cliffs of Jerseyman island; or inside of them by steering for the steeple of the westernmost church and Marache point exactly in line, bearing N.N.E. $\frac{1}{4}$ E., until within a quarter of a mile of the point; then, after keeping away a little to pass the point, and the shoal water mentioned off its north side, they will have to beat up Capodiette bay until the marks for running in, namely, the westernmost church open a little to the eastward of the flag-staff bearing North, come on.

In approaching Arichat from the westward, the only outlying danger, besides the Cerberus rock (page 166), is the Creighton shoal (page 171); and this last will be avoided if, after passing the Peninsula shoals (page 147), Bear head be not shut in behind Peninsula point until the westernmost church at Arichat is seen to the southward of the Crid islands; a mark which also leads clear of the Picard reef, and of all the shoal water off Creighton island. The Crid islands, which are small and rocky, form the north side of the Crid pass, the whole breadth of which across to Beach point is about $1\frac{1}{2}$ cables, but there are half tide rocks off both ends of those little islands which reduce the navigable breadth of the channel to a cable. The extremity of Beach point, which is all shingle, may be safely passed as near as 60 yards; but on the outside of the point the shoal water commences immediately, and continues increasing in breadth from the shore to the western extremity of the island, where it extends a third of a mile from the cliffs to the N.W. and West; and still farther to the S.W. and South; in which last direction it unites with the Henley ledges.

With the necessary leading wind, that is, from South, round west, to N.N.E., having cleared the Creighton shoal, as already directed, bring the steeple of the westernmost church to appear through the middle of Crid pass, or a little to the northward of Beach point, when it will bear E. $\frac{1}{2}$ S. Keep it so while running towards it, and when the vessel has arrived within half a mile of the point, if Robin wharf and stores (on the south side of the harbour) be not already seen to the northward of Beach point, sheer a little to the northward till they are so, and then steer for them E. by S. $\frac{1}{2}$ S., or so as to pass the point at any distance between 60 and 200 yards, into the harbour, where a berth may be selected, as already directed.

TIDES.—It is high water at Arichat, full and change, at 8h. 10m.; and the ordinary rise is from 4 to 5 feet; but extraordinary springs may rise 6 feet. The stream of flood comes in by the eastern entrance, running through the harbour to the westward, and the ebb stream the contrary; but these streams are not very regular, and seldom exceed the rate of one knot.

LITTLE ARICHAT, situated inside of Creighton island, and 2 miles N.W. from Arichat, is a small and secure harbour, where the fisheries are extensively prosecuted. The approach is from the westward, and over a bar, with 17 feet at low water, which extends across to the northward from Arichat head, the west extremity of Creighton island. The entrance of the harbour, half a mile within this bar, is $1\frac{1}{2}$ cables wide between Creighton and Bosdet points; the former being a long spit of sand and shingle, with stores and a wharf, on the north side of Creighton island. Vessels lie immediately within the entrance in $3\frac{1}{2}$ fathoms, and as securely as in a dock, the harbour being closed at the east end by a bar of shingle,

which dries at low water. A stranger might require the aid of a pilot, but the chart with the following brief directions would enable any intelligent seaman to take his vessel into this small but pretty harbour.

DIRECTIONS.—Bring the wharf on the north side of Bosdet point to bear between E. by S. and E. ½ S., and steer for it, the vessel will then pass the bar in not less than 15 feet at low water. Continue the same course until the shingly south-west extremity of Bosdet point and the north-east extremity of Creighton island (at the east end of the harbour) are touching, and bearing S.E. ½ S., when alter course, and keep the last named marks in one exactly, running towards them until Bosdet point is distant only 1½ cables ahead, and the shingly south-east extremity of Creighton point bears S.W. by S., and is distant a cable; then alter course to the southward, so as to be two-thirds of the distance over from Creighton point towards Bosdet point, as the vessel passes between them into the harbour.

LE BLANC and HADDOCK HARBOURS.—Le Blanc harbour has its entrance half a mile from Little Arichat and in the north-east corner of the same bay. Six feet at low water can be carried in through its very narrow entrance, and there is much more within. It is an extensive place, containing a population of fishermen and small farmers.

At the north-west extremity of this harbour is the Mousselier pass, very narrow, between mussel beds, and only one foot in it at low water. Boats pass through it into Haddock harbour, the principal entrance to which is from the Lennox Passage, by a very narrow channel, to the eastward of Campbell island, but it has 20 feet in it at low water. Both these last named harbours are occasionally resorted to by small vessels in the fishing season, but they are of no use to large ships.

In the bay between Arichat head and Peninsula point are Deep cove and Janvrin harbour barred by Dorey ledge, and only useful to small craft and boats. In the entrance of Janvrin harbour, and 1½ miles eastward from Peninsula point, lies Delorier island, from which extend the rocky Bentinck shoals to the S.W. The least water on these shoals is 4 feet, but as they lie in a bay, they are not much in the way of vessels; they join the Peninsula shoals to the westward, which, with the southern entrance of the Gut of Canso, have already been described in page 147.

CREIGHTON SHOAL is the only danger outside the line joining Arichat head and Peninsula point, excepting the Peninsula shoals. It is rocky, and the least water, 11 feet, lies with the westernmost church at Arichat, just shut in behind the southern extremity of Creighton island; it bears West and is distant three-quarters of a mile

from Arichat head. The marks for passing to the northward of it will be useful to vessels bound to and from Little Arichat, and are, Bosdet point and wharf just open to the northward of Creighton island, bearing E. $\frac{1}{4}$ N. Bear head and Peninsula point in one, bearing N.W., lead past it at the distance of a third of a mile to the south-west; and the above church at Arichat, open to the southward of the Crid islands, bearing E. $\frac{3}{4}$ S., not only leads a quarter of a mile to the southward of the Creighton shoal, but also clears the Picard reef, which extends 2 cables to the westward from the south point of Creighton island.

From CAPE ARGOS to GUYSBOROUGH, at the head of Chedabucto bay, a distance of 12 miles, the prevailing features are peninsulated points of drift sand, clay, and boulders, resting on sandstone, and presenting low cliffs to the sea. These are united to the main land by beaches of shingle, inclosing large ponds, several of which admit boats at high water when the surf is not too heavy. In the rear of these ponds are the houses of a scattered population, subsisting by fishing and farming, and situated on the southern slope of ridges rising to the height of 200 feet above the sea. From Cape Argos the coast trends S.W. by W. 2 miles to Oyster point, whence Grady point bears W. by S. $1\frac{3}{4}$ miles. The Murdoch ledge, dry at low water, and half a mile off shore, lies midway between the two last-named points.

Ragged head, 4 miles W. $\frac{1}{4}$ S. from Grady point, is a rocky peninsula, forming the apex of a triangle, the sides of which are long shingle beaches, enclosing a large pond with 5 or 6 fathoms water, but boats can enter it only at high tide by a narrow outlet on its western side. This remarkable headland, which appears like an island when seen from a distance, forms the eastern point of Moose bay, which is $2\frac{1}{4}$ miles across to Moose point, in a W. by N. direction, and three-quarters of a mile deep. In shape, this bay is a semicircle, with shingle beach, unbroken, excepting by the shallow outlets of ponds. It affords anchorage in from 5 to 7 fathoms, sand and mud bottom; but it can be considered safe only in fine summer weather, on account of the heavy swell which accompanies easterly gales at other seasons. The only danger to be avoided is the flat of sand which extends nearly half a mile off the eastern side of the bay. In the remaining distance of $2\frac{1}{2}$ miles, from Moose point to Guysborough, all that requires particular notice is a rocky bank, extending half a mile out from the shore midway between them, and on which there are 19 feet at low water.

HYDRA ROCK, one of the greatest dangers in Chedabucto bay, lies directly off Grady point, from which it bears S.S.E. $\frac{1}{2}$ E., and is distant $1\frac{1}{2}$ miles. It carries 12 feet least water. The part of the shelf on which there are less than 3 fathoms, is only a cable in diameter; but there are

less than 5 fathoms over a much larger space. The depth is 8 or 9 fathoms between it and the land, and 11 or 12 fathoms outside it at the distance of a quarter of a mile.

During the heavy swell from the eastward, so frequent in this bay, the position of this rock is shown by heavy breakers ; at other times it is exceedingly dangerous, especially to vessels approaching it from the south-west, as on that side there are no good leading marks. The mark for passing a quarter of a mile to the south-east of it, is Cape Argos and Thomas head touching, bearing N.E. $\frac{1}{2}$ N.

From CAPE CANSO to GUYSBOROUGH, a distance of 25 miles, the south coast of Chedabucto bay is composed of primary rocks, partially covered with drift sand, clay, and boulders. This drift appears occasionally in high and red looking cliffs on the shore ; when cleared of stones, it furnishes a tolerably productive soil, from which, however, the large fishing population obtain little beyond a few vegetables, and food for their cattle. The climate is not favourable to agriculture. Drift ice in the month of May, and in June the prevailing easterly winds, bringing fog from a cold sea, check vegetation until past midsummer, and seldom allow of settled warm weather before July. But fishing, not farming, is here the great business of life, as it has been ever since the first settlement in this country. Cod-fish, herrings, and mackerel swarm along these shores, and the latter especially are taken in incredible numbers, both in the spring and fall of the year, by the numerous schooners occupied in this important pursuit.

CAPE CANSO is a low islet, nearly joined to the east point of Andrew island : and the Cape rock, small and 8 feet high, will be seen off it $1\frac{1}{4}$ cables to the S.E. by S. At $1\frac{1}{4}$ miles to north-west is Glasgow head, a remarkable red clay cliff 50 feet high. An equal distance farther in the same direction, along an unbroken shore, is the town and harbour of Canso.

CRANBERRY ISLAND with its most useful lights, marks the east side of the entrance of the channel into Canso harbour. The island is low, rocky, and a quarter of a mile long. The lighthouse* stands near its northern end, and is of wood, octagonal in shape, 60 feet high, and painted with red and white horizontal stripes.

LIGHTS.—The lighthouse on Cranberry island exhibits two *fixed white* vertical lights, 35 feet apart. The upper light, 75 feet above high water, can be seen from a distance of 15 miles ; the lower being an inferior light, 40 feet above high water, only from a distance of 9 miles. They bear

* *See* View on Plan of Canso Harbour, No. 2 163.

from Cape Canso, N.E. by N. $1\frac{1}{4}$ miles; but dangers on either side reduce the breadth of the clear channel to half a mile.

FRYING PAN, CROW, and PETIT-PAS ISLETS.—The Frying pan, a low islet of shingle, a quarter of a mile, N. by W., from the lighthouse on Cranberry island; and Crow islet, a low rock, covered with dark spruce bushes, not exceeding 20 feet in height, and distant three-quarters of a mile farther in the same direction, will easily be distinguished. Still more remarkable is Petit-pas, a small, round, grassy islet, a cable in diameter, with a red clay cliff 50 feet high, and $1\frac{1}{4}$ miles N.W. $\frac{1}{4}$ N. from the lighthouse.

OLIVER ISLAND is wooded, and separated from the east end of George island by a narrow boat channel. Its eastern extremity, Lock point, forms a leading mark, and bears from Petit-pas N.E. $\frac{1}{2}$ E., a quarter of a mile.

GRASSY ISLAND, a third of a mile to the westward of Petit-pas, is a hill of drift-sand, clay, and boulders, half a mile long, and 66 feet high. It is covered with grass, and displays the only other clay cliff besides that of Petit-pas on the east side of the channel to Canso harbour. It is no longer insulated, being now united to George island by a bar of shingle, which is never covered. The remains of an extensive redoubt give the name of Fort point to the high, western extremity of the steep, grassy bank of this island, which, as it is used for a leading mark, must be carefully distinguished from the edge of the shingle beach, extending from it one cable to the north-west, and also used for a leading mark. There is a narrow channel for boats between the Grassy island beach and Piscatiqui island, which last forms the eastern side of the channel for the remaining distance to Canso harbour.

CANSO HARBOUR is a place of considerable historical as well as nautical interest. It was visited by the French fishermen and fur traders as early as the sixteenth century, and during the next two hundred years it was the frequent scene of French and Indian warfare with the British colonists; falling, with the rest of Arcadia, alternately under the power of France and of England until the contest for dominion in America was finally terminated in 1759. The traces of an extensive fort are yet to be seen on Grassy island, or rather peninsula, being joined to the south-west side of George island by a ridge of shingle.*

The position of this harbour, at the southern entrance of the great bay of Chedabucto, through which such numbers of vessels are continually passing, gives it an importance that it would not otherwise possess. Many vessels pass through the harbour in order to avoid going round

* *See* Plan of Canso Harbour, No. 2,163; scale, *m* — 4 inches.

the dangerous rocks and ledges which lie outside of it, and it is frequented by many others engaged in the fisheries, or using it as an occasional anchorage.

The harbour is formed by Piscatiqui and George islands on the east, and by the mainland and Durell island on the west. Cutler island, together with the shallow water between it and Durell island, shelter it from the north; while Grave island and the bar uniting it to Lanigan beach protect it from the south-east. Grave island is very small, with steep clay banks fast wasting away by the action of the sea. The entrance to the harbour is between the latter and Cutler island, towards the wharves of the town, off which the anchorage is quite secure, with water for vessels of the largest draught; but the Ship channel, which runs through into Chedabucto bay, passes to the eastward of those islands, between them and Piscatiqui. The least water in this channel, 4 fathoms, is on a bar which stretches across from Grave island to Piscatiqui island.

The town of Canso is on the mainland, the more ancient part standing on hills of red sand, clay, and large boulders. The church, built on the summit of a ridge 100 feet high, is a conspicuous object seen over the islands from a great distance at sea. The newer part of the town, together with the two chapels, are farther westward, along the shore of the Tickle, a narrow boat channel separating Durell island from the mainland. The whole forms a long straggling village, with a population of about 600. Near the north point of Durell island, which is $1\frac{1}{2}$ miles long, is Flag hill, 105 feet high, which is used as an important leading mark.

DANGERS on WEST SIDE of SHIP CHANNEL.—The following description of the objects and dangers on either side of the Ship channel into Canso harbour, in the order in which they would be passed by a vessel running in from sea, will sufficiently explain the Admiralty chart, without which, or the aid of an experienced fisherman of the place, to whom the appearance of every rock and breaker is familiar, no one should attempt a navigation so hazardous.

Patch and Boom Rocks.—Approaching from the southward, the entrance of the Ship channel between Cape Canso and Cranberry island is a mile wide. The outermost danger on this side is the Patch, a rock, on which no less than 30 feet water was found, but on which the sea is said to break occasionally: it bears from Cape Canso S.S.E. $\frac{1}{2}$ E., $1\frac{3}{4}$ miles.

Next to the Patch is the Boom rock, with 12 feet least water, bearing South $1\frac{1}{2}$ miles from Cape Canso; and E.S.E. $1\frac{1}{2}$ miles from the south point of Andrew island. It has obtained a melancholy celebrity, by the loss of a schooner on it with all hands while this survey was in progress.

Cape Breaker and Roaring Bull.—The Cape Breaker, with 16 feet water, bears from Cape Canso S.E. by E. one mile. A vessel will pass to the eastward of it by keeping Crow and Cranberry islands touching, bearing N. by W. As it can be seen only when there is a heavy sea, this rock is extremely dangerous, and would be still more so were it not that the Roaring Bull, 4 cables to the westward, almost always shows, and therefore points out the position of its treacherous neighbour. The Roaring Bull has 2 feet least water, and bears from Cape Canso S.E. $\frac{1}{2}$ S., two-thirds of a mile.

Keeper, Kirby, and Black Rocks.—Keeper and Kirby rocks, with 24 and 15 feet water, are distant half a mile and one mile respectively N.W. by N. from the Cape Breaker; the Kirby bears from Cape Canso E.N.E., and is distant 3 cables. The steeple of the church at Canso, open to the north-east of Glasgow head bearing N.W $\frac{1}{2}$ N., leads just clear to the north-east of the Cape Breaker, and of the other dangers above mentioned.

The Black rocks lie N.N.W. half a mile from the Kirby rock, the passage into Glasgow harbour being between them. They are two masses of trap rock about 5 feet high above spring tides, they can therefore always be seen, and as the shoal water extends from them only a cable's length to the eastward, they are of great use in pointing out the western side of the channel.

Bootes Bank, and Man-of-War and Mackerel Rocks.—The Bootes with 6 feet least water, and the Man-of-War rock, which covers at half tide, lie farther to the N. by W.; the latter, the most distant, being a long half mile from the Black rocks. There is no safe channel for ships between these three last named dangers, which all rise from a shoal and rocky bank, which stretches across the entrance of Glasgow harbour; but there is a navigable channel between them and Glasgow head, though narrow and difficult.

The Man-of-War rock bears from Glasgow head E.N.E. about half a mile. It lies much in the way, but is usually shown by breakers, and the marks for it are distinct and good. The eastern ends of the Black rocks and of the Cape rock when in one, bearing S. $\frac{1}{2}$ E., lead just to the eastward of it, and, of course, clear the Bootes; therefore let the Cape rock be kept open to the eastward of the Black rocks until Man-of-War rock is past; which will be the case when Flag hill (page 175), comes in line with the steep bank (not the beach) of Fort point, bearing N.W. The last named marks lead just clear to the north-east of this dangerous rock.

The Mackerel rock lies half a mile farther to the north-west. Having 10 feet water, it seldom shows, and is therefore the more dangerous. When on it, the eastern extremes of Oliver island and of Derabie East

rock are in one, and just open to the eastward of Petit-pas, which bears from it N.E., 4 cables. The same marks which clear the Man-of-War rock, namely Flag hill and the steep bank of Fort point, as above mentioned, lead to the north-east of this rock also, at the distance of half a cable. There is a clear channel on either side of the Mackerel rock, but that to the north-eastward of it has the advantage of leading marks.

South Shoal is the last danger on the west side of the Ship channel, until the vessel arrives at Grave island (page 175), and the entrance of Canso harbour. It has 7 feet least water, and extends 3 cables off shore, or half way across towards the eastern extremity of Grassy island ; leaving a clear channel between it and the Grassy reef of $1\frac{3}{4}$ cables in breadth.

The shoal water extends only half a cable off Grave island, leaving a channel between it and Piscatiqui island a cable wide, and 4 fathoms in it at low water.

DANGERS on EAST SIDE of SHIP CHANNEL.—The Stanley shoals are four small rocky patches a quarter of a mile apart. The least water, 4 fathoms, is on the northern and western patches, and is sometimes shown by breakers.

The northern patch lies with Flag hill and Fort point in line, and with Cranberry island lighthouse bearing N.N.W. $\frac{3}{4}$ W., $1\frac{1}{2}$ miles. From the western patch the eastern extreme of Crow island is just shut in behind the eastern extreme of Cranberry island, and the lighthouse bears N. by W. $\frac{1}{2}$ W. $1\frac{1}{2}$ miles.

The western extremes of Derabie and Cranberry islands in one, and bearing N. by W. $\frac{1}{2}$ W., lead in between these shoals and the Cape Breaker (page 176).

Nickerson and David Rocks.—From the Nickerson rock, with 4 fathoms least water, the lighthouse bears N.W. $\frac{1}{2}$ W. $1\frac{1}{4}$ miles, and lying half a mile N.N.E. $\frac{1}{2}$ E. from the Stanley shoals, it is less in the way than they are. The same remark applies to David rock with 13 feet water, it being half a mile nearer to the lighthouse, which bears from it N.W. $\frac{1}{4}$ N. three-quarters of a mile.

Washball and Pink Rocks.—The Washball, a rocky patch, dry at low water, lies W.S.W. 2 cables from the David rock, and S.S.E. $\frac{3}{4}$ E. 7 cables from the lighthouse : it is, therefore, half way out from the lighthouse towards the Stanley shoals, and, as it can almost always be seen, is of great use in guiding vessels. These two last named rocks lie so near the edge of the Cranberry island bank, as to leave no safe passage between them.

The Pink, a rock with only 4 feet water on it, lies half a mile to the southward of the lighthouse ; but an arm from it with 18 feet water extends $1\frac{1}{2}$ cables W. by N. From this rocky arm, which forms the extreme southern edge of the Cranberry island bank, the lighthouse bears N.N.E.

half a mile. Flag hill (page 175), and the south-west extremity of the *beach* of Fort point in line, and bearing N.W. $\frac{1}{4}$ N., lead just clear to the southward of this danger ; but the beach cannot always be made out, in which case Flag hill should be kept about half a point open to the south-west of Fort point, until the bearing of the lighthouse shows that the rock is passed.

The shallow water, less than 3 fathoms, including two rocks awash called the Cow and Calf, does not extend off the west side of Cranberry island beyond 2 cables, but there are several rocky patches farther off, which carry $4\frac{1}{2}$ fathoms, and therefore only dangerous to vessels of large draught when the sea is heavy ; from the outermost of them, the lighthouse bears S.E. by E. $\frac{3}{4}$ E., nearly half a mile.

Frying Pan, Pas, and Grassy Reef.—Proceeding to the northward, the next danger bordering the Ship channel is the Frying Pan reef, running out N.W. by W. 4 cables from the low Frying Pan islet, and separated by a narrow channel from the Pas reef, which extends half a mile in the opposite direction, or S.E. by E. from Petit-pas. From the Pas reef the edge of the shoal continues to the westward, skirting Petit-pas at the distance of $1\frac{1}{2}$ cables, and then crossing the bay, between it and Grassy island, where it joins the shoal water off the latter.

Grassy reef is extremely dangerous. Projecting S. by E. a quarter of a mile from the south-east extremity of Grassy island, it diminishes the breadth of the deep water between it and the equally dangerous Mackerel rock (page 176), to $1\frac{1}{4}$ cables, and as the channel is crooked there, as well as narrow, they form a difficult pass for large vessels.

The shallow water extends a cable's length off the south-west side of Grassy island. The beach of Fort point is quite bold ; and after which the channel, although much narrowed by Grave island, is direct and clear to Canso harbour.

DANGERS in N.W. ENTRANCE to CANSO HARBOUR.—The difficulties of the North-west entrance of Canso harbour arise principally from the narrowness of the channel between Cutler and Piscatiqui islands, where the deep water is less than 80 yards wide ; and from the position of the Starling rock being so much in the way. It is a passage that should not be attempted in a large vessel without a fair and steady breeze ; for although the dangers about to be described are for the most part visible, yet there is no safe anchorage in the event of the wind failing, the bottom being of rock.

Net, Whitman, and Bald Rocks.—On the western side of this entrance the dangers are, the Net rocks, which dry at a quarter ebb ; and the Whitman rock, with 2 feet least water. They both lie off the east side of Durell island, at the distance of 2 cables ; the first being

distant $5\frac{2}{3}$ cables, and the second $3\frac{1}{2}$ cables from the north end of Cutler island, from which shoal water extends one cable towards them. The marks which just lead clear to the eastward of both these rocks, and the shoal water around them, are the church steeple at Canso, and the western extremity of Cutler island in line, bearing S. $\frac{1}{4}$ W.

On the eastern side of the entrance, and distant $1\frac{1}{2}$ cables from the north end of Piscatiqui island, is the Bald rock, of bare granite, 140 yards long, and 30 feet high. It lies directly opposite to the Whitman rock, and the channel between them is 2 cables wide. There is a rock, dry at low water, lying a cable outside or to the N.N.E. of the Bald rock, and shoal water half a cable farther off in the same direction; but off the west side the shoal does not extend beyond half a cable, and is cleared by the above church steeple and the house on Cutler island in line bearing S. $\frac{3}{4}$ W.

The only other danger, on this side of the entrance, is the reef off the north-west point of Piscatiqui island, which is partly dry at low water, and extends three-quarters of a cable out to the north-west. This reef will be cleared if the church steeple be kept open to the westward of the house on Cutler island; or by Glasgow head and Piscatiqui island touching, and bearing S.S.E.

Starling Rock, lying S.E. by S. 230 yards from Cutler island, and 120 yards off the western shore of Piscatiqui island, and in the very line of the narrow channel between these islands, with only 4 feet over it at low water, renders this entrance extremely dangerous to strangers; for the channel between this rock and the shoal water, which extends $1\frac{1}{4}$ cables off the south end of Cutler island, is only 80 yards wide. Lanigan's old house only just open to the eastward of Grave islet will lead through this narrow pass; but to render it safe and easy to strangers, two beacons are much required; one on Grave islet, and the other should be properly placed on the hill to the southward.

DIRECTIONS through SHIP CHANNEL.—To enter Canso harbour from the southward, through the Ship channel, with a leading wind; at any distance not less than 3 miles, bring the lighthouse on Cranberry island to bear N. by W. $\frac{1}{2}$ W., when Crow islet (page 174) will be in one with and seen over Cranberry island. Steer for the lighthouse on that line of bearing, taking care not to open the whole of Crow islet out to the westward of Cranberry island (for fear of the Cape Breaker, page 176) until the church steeple at Canso is seen to the north-east of Glasgow head, bearing N.W. $\frac{1}{2}$ N. As soon as that steeple opens to the north-east of Glasgow head, steer N.N.W. $\frac{1}{4}$ W., or so as to make a direct course towards the south-west side of Petit-pas; and there will be no difficulty in passing

between the Black rocks, which can always be seen, and the shoals off Cranberry island, if attention be paid to the leading marks already given for clearing the last named dangers.

Continue the course towards Petit-pas, taking care that the Cape rock is kept open to the eastward of the Black rocks, until Flag hill comes in line with the *steep bank* of Fort point (page 174), bearing N.W. Then steer N.W. on the last-named leading marks, taking care not to open Flag hill in the least to the south-west of the *steep bank* of Fort point until the eastern extremities of Petit-pas and Oliver island come in one, bearing N.E. $\frac{1}{2}$ E. Then alter course instantly, and steer W.N.W. for the church at Canso, until Petit-pas and Crow islands are touching, and then N.W. $\frac{1}{2}$ W., for the south-west end of Grave islet, keeping Walsh's house (on Durell island on the north-east side of the entrance of the Tickle) just open to the south-west of it, by which the vessel will pass midway between the Grassy reef and the South shoal, and clear of the shoal water off Grassy island. As soon as the north-west extremity of the *beach* of Fort point bears N.E. steer N.N.W. $\frac{1}{2}$ W., or for the wharf and stores on the west side of Cutler island, until the lighthouse on Cranberry island and the southern extremity of the *beach* of Fort point come in one. Then steer N.W. $\frac{3}{4}$ W., keeping the last-named leading marks in one astern, and they will lead clear of the shoal off Grave islet; round which, and at any distance from the islet between 120 and 240 yards, the vessel may haul to the westward into the harbour.

The intelligent seaman, after having once become acquainted with the appearance of the various objects, dangers, and leading marks, would find little difficulty in varying his mode of proceeding, so as to suit the cases of a scant wind from either side, or even in beating in, if his vessel were not too large, and the weather favourable: but the risk of being surprised by the prevalent fogs, among so many dangers, should always be borne in mind when about to take this channel.

Through N.W. ENTRANCE.—To enter Canso harbour by North-west entrance:—Being outside the Net rocks, bring the church steeple at Canso to bear S. $\frac{1}{2}$ W., when it will be seen over Cutler island, midway between the house on the island and its western end. Steer S. $\frac{1}{2}$ W. for the church steeple so seen, and it will lead in nearly midway between the Bald and Whitman rocks; and when the red clay cliff of Glasgow Head is seen through the channel between Cutler and Piscatiqui islands, bearing S.S.E., steer for the head, keeping in mid-channel until the south end of Cutler island bears W.S.W; then again alter course and steer for Grave islet, keeping Lanigan's old house only just open to the eastward of it, and after running 2 cables, or no farther than when the lighthouse on Cranberry island appears in one with

int, haul to the westward into the harbour.

TIDES.—It is high water, full and change, in Canso harbour, at 7h. 48m.; ordinary springs rise 6½ feet, and neaps 4½ feet. The duration of the rise and fall, and still more of the streams, is influenced by winds or other causes; but the rate of the streams in the North-west entrance of the harbour, where they are strongest, does not often exceed one knot. The flood comes from the southward, the ebb from the opposite direction.

OFF-LYING ISLANDS and CANSO LEDGES.—The small islands lying outside Canso harbour, and not previously mentioned, have the names of Hog, Cook, Welsh, and Derabie, and with many nameless rocks form a chain 1½ miles long in an E.S.E. direction, terminating with the East rock, which is of bare granite, 20 feet high, and distant a long half mile N.N.E. from Crow island. Rocks awash, and shallow water continue from the East rock 4 cables to the eastward; but on the north side these islands are bold to within a cable's length, excepting at their west end, where the Black rock and the shoal around it extend 2 cables from Hog island to the northward. The Black rock, which is seldom, if ever, entirely covered, is half a mile E.N.E. of the Bald rock (page 180,) and between them lies the entrance to a channel between the outer islands and Piscatiqui and George islands, which is full of rocks, and only navigable by boats and very small fishing vessels. The outer islands are occupied by fishermen during the season, but the north shore of George island by more permanent residents. All these islands are formed of granitic rocks, excepting Grassy island and Petit-pas, and most of them are sparingly wooded with dwarf spruce trees.

The East rock bears from the lighthouse on Cranberry island N. ½ W. 1¾ miles; and to the east of the line joining them lie a number of dangerous rocks with deep water between them. The innermost of these, the Fanning and Scott rocks, with 12 and 9 feet least water respectively, lie on the eastern edge of the Cranberry island bank, and at the distance of half a mile from the lighthouse; while Park ledge, always above water, Crow reef, and the Budget rock are in like manner nearly united by shoal water to Crow island. There is a deep channel between the Budget rock and the Frying Pan, but it is narrow and destitute of good leading marks. Next, outside of the dangers which have been mentioned, are the Kelp rocks, Inner Bass, Middle rock, and Broad shoal: of these, the first and last have 12 and 9 feet least water respectively, and only show when there is a sea running; but the Inner Bass is awash at low water, and the Middle rock having only 4 feet water, can almost always be seen.

From the Middle rock the lighthouse bears S.W. by W. ¼ W. 1½ miles; and the church steeple at Canso is seen over Petit-pas, and open a little to the southward of the Park ledge. The breakers on this rock and the

Inder Bass, which lies $3\frac{1}{2}$ cables from it to the N.N.W., often serve as a guide to fishing and coasting vessels, which prefer passing close to them to going round outside all; but this cannot be recommended for large ships, for although the passage between the Middle rock and the Bass rock is a mile wide, yet the Sand shoal and the White rock, with 5 and 4 fathoms respectively, and another nameless patch of the same depth as the latter, render it unsafe in the heavy swell which so frequently prevails.

The Bass rock has 6 feet least water, and therefore breaks frequently. From it the lighthouse bears W. by S. $2\frac{1}{4}$ miles; and the church steeple at Canso, and the southern extremity of Petit-pas, appear in line.

The Grime rock has 12 feet least water, and is therefore only shown by breakers when the sea is heavy. It lies farther out than the Bass rock, from which it bears N.E. $3\frac{3}{4}$ cables; and there is a patch of 28 feet water a quarter of a mile to the eastward of it. From the Grime rock the lighthouse bears W. by S. $\frac{1}{4}$ S., distant $2\frac{1}{2}$ miles, and the church steeple at Canso, the southern extremity of Grassy island, the northern end of Petit-pas, and Park ledge, all appear in one, and open a little to the southward of Crow island. These last-named rocks are the outermost of the Canso ledges, and lying off a great headland which so many vessels are continually rounding, and in a region celebrated for fogs they are exceedingly dangerous.

CAUTION.—In passing round these dangers in thick weather, great caution and the constant use of the lead are indispensable. If the approach be from the northward, remember that they lie only 4 cables within the 30 fathoms edge of the bank; if from the southward and eastward, go into no less than 25 fathoms until the soundings indicate that the vessel is off the bank to the northward; and, lastly, in clear weather, do not haul to the westward into Chedabucto bay until the high land of Black point opens to the northward of Derabie island, bearing W.N.W.

FOX ISLAND and FOX ROCKS.—Fox island, lying $4\frac{1}{2}$ miles to the westward of Canso, is granitic, half a mile long, and 40 feet high. There are rocks, above and under water, off both ends of this island to the distance of 2 cables; and it is connected with a shingle point of the main land, distant $3\frac{1}{2}$ cables, by a bar of sand and stone nearly dry at low water.

The Fox rocks lie off Lazy head, between Durell and Fox islands, and dry at low water; the Outer Fox being half a mile off shore, and the same distance eastward from Fox island. Neither of these rocks lie outside the line joining the north extremities of the islands, and are therefore not much in the way of vessels running along the coast. The north point of Fox island and the pitch of Black point in one, clear the Outer Fox in 5 fathoms; and also the shoal off Tickle island.

Fisheries. — The shingle beaches on the main land and on the south-west side of Fox island are covered with the huts of the fishermen, who resort here in great numbers during the season, this being one of the greatest fishing stations in these seas, especially for mackerel and herrings. The fishing vessels lie in Fox bay to the westward of the island, in 4 to 7 fathoms, sandy bottom ; but this anchorage is insecure being exposed to northerly winds, and also to the heavy easterly swell which occasionally rolls in round the reef. In north-west winds and fine weather these vessels sometimes shift round to the eastward of the island, but the ground there is rocky, and the anchorage unsafe.

HALF ISLAND and PHILIP COVES.—Half Island cove, $1\frac{1}{2}$ miles to the westward of Fox island, affords a small and unsafe anchorage, being open to the winds and swell from the north and east. Off the small island, on the west side of this cove, there is a dangerous rock, lying a cable from it to the eastward.

Philip cove, 2 miles farther to the westward, affords shelter to boats, the sea being kept out by rocks in the entrance, and which become dry soon after high water.

CROW HARBOUR, celebrated for its mackerel and herring fisheries, is a mile from Philip cove, and 12 miles to the westward of Canso. It has excellent holding-ground, and water enough for vessels of the largest draught ; but there is not room for many large vessels in the eastern part of the harbour, where alone they would be secure from the heavy Atlantic swell which occasionally rolls in.

Rook island is a rock a cable long, lying nearly in the middle of the entrance ; and the Rook rock, with 3 feet least water, lies 70 yards off the north-west extremity of the island, with deep water close to. The channel to the westward of the island has 17 fathoms water in it, and is 3 cables wide at the entrance, between Rook and Corveau rocks, which last are dry at low water, and form part of the reef off Lamb point.

The channel to the eastward of Rook island, between it and the Brodie rocks, is generally preferred with easterly winds, although having only 23 feet water, and one cable wide. The Brodie rocks, which dry at low water, form part of the reef which extends $2\frac{1}{4}$ cables from Lazy and Brodie points towards Rook island, giving security to the eastern part of the harbour. The mark for clearing these rocks, and the shoal water within them on the north-east side of the harbour, is Lamb point and the extreme of the land to the westward in one, bearing N.W. by W.

DIRECTIONS.—In the absence of buoys and beacons, vessels wishing to enter Crow harbour, should, in approaching from the eastward to avoid the shoal which extends $1\frac{1}{2}$ cables off Lazy point, bring the east end of Rook island to bear nothing to the westward of S.W. by W., and steer for it until within the distance of 2 cables, then alter course to S.S.W., or, as may be necessary, to pass between half and $1\frac{1}{2}$ cables to the eastward of that island. When the vessel has run $1\frac{1}{2}$ cables past the island, the marks already given for clearing the Brodie rocks, and the shoal water on the north-east side of the harbour, will come on, and enable her safely to haul in to the south-east, and choose a berth in 6 or 7 fathoms, over a mud bottom.

In approaching the harbour from the westward, to avoid the shoal off Lamb point as well as the Corveau rocks, bring the west end of Rook island to bear nothing to the eastward of S.E. by S., and run for it until within the distance of a quarter of a mile, then alter course to the southward so as to pass a cable or more to the westward of the island, and then steer about S.E., passing at the same disance from the island, and having regard to the leading marks for clearing the Brodie rocks, she may take a berth as before.

TIDES.—In Crow harbour it is high water, full and change, at 8h., and the rise is from 6 to 4 feet, as it may be spring or neap tides. There is little or no stream of tide within the harbour.

SALMON RIVER.—At the distance of half a mile to the westward of Lamb point is the first of three remarkable high clay cliffs, which point out the position of Crow harbour from a distance ; after which there is nothing deserving particular notice along the hilly, bold, and rocky coast up to the Salmon river, unless it may be Half-way cove, as affording a landing place for boats.

The Salmon river, the entrance to which is $8\frac{1}{2}$ miles from Crow harbour, is navigable for boats to the distance of 2 miles in from its very narrow entrance, on the bar of which the depth is only 3 feet at low water. Shoal water extends a quarter of a mile out from the entrance, and a rocky ridge with 4 fathoms least water projects three-quarters of a mile farther to the eastward. Bigby head, a remarkable cliff 100 feet high, separates this river from Toby cove, another place for boats, with 4 feet on its bar at low water.

GUYSBOROUGH HARBOUR, at the head of Chedabucto bay, lies a mile N.N.W. from Bigby head, and 10 miles from Crow harbour. It is an extensive inlet, running in to the northward, with a depth of water sufficient for vessels of large draught ; but with such a dangerous bar, an

entrance channel so narrow and crooked, and such rapid tides, that no written directions could be available. The assistance of a pilot acquainted with every local peculiarity of the tides and winds is indispensable for the safety of a vessel even of very moderate size, either in entering or leaving this harbour, as will appear from an inspection of the chart and the following brief description.*

LIGHT.—The lighthouse which stands on the end of the shingle beach of Peart point, on the west side of the entrance to Guysborough harbour, is a temporary structure of wood, 20 feet high, square, and painted white. It exhibits at 30 feet above the level of high water, a *fixed white* light, which in clear weather is visible from a distance of 7 or 8 miles.

Outer and Inner Bars.—The entrance channel into Guysborough harbour between Peart point and Stony patch is 80 yards wide, and carries 6 fathoms water ; but farther out and stretching across from Toby point to Hadley beach there is a bar of sand, with 17 feet on it at low water, and which is rendered impassable at times by heavy breakers. This is called the Outer bar.

The Inner bar lies across the inner entrance, which is 230 yards wide, between Eliza point and Hadley beach. The depth which can be carried over it is 13 feet at low water, in a channel only 80 yards wide. Before arriving at this bar there is room enough for a vessel or two to anchor in the mouth of Ingersol creek out of the strength of the tide, and sheltered from the sea by Stony patch.

DIRECTIONS.—The course across the Outer bar, in the deepest water, is W.N.W., steering for the lighthouse until within the distance of a cable, then curving gradually to the northward and eastward, as the vessel passes the beach off Peart point at the distance of 60 yards, and crosses the mouth of Ingersol creek to the Inner bar. The course then becomes E.N.E. for a cable's length while crossing that bar, and then northerly through a clear and deep channel for three-quarters of a mile to the safe and spacious anchorage off the town.

Guysborough, the county town, is advantageously situated on the western side of the harbour, the deep water approaching close to its wharves. It contained in 1849 about 500 inhabitants, and has two churches ; the northernmost standing 95 feet above the sea at high water. The hills attain the height of 500 feet on either side of this beautiful inlet, which is navigable for ships up to the Narrows, where the depth is 8 feet at low water, at 4 miles from the entrance. Small vessels may proceed 3 miles still farther, and boats to the bridge, where the tide ends at $8\frac{1}{2}$ miles from the

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* *See* Chart of Guysborough Harbour, No. 2,688 ; scale, $m = 4$ inches.

entrance, and where the Guysborough river, a small stream, enters the inlet, flowing through rich meadows called the Guysborough Interval.

TIDES.—The time of high water, full and change, at the entrance to Guysborough harbour, is 8h. 20m.; and ordinary springs rise $6\frac{1}{2}$ feet, and neaps $3\frac{1}{2}$ feet. The streams in the narrow entrance of the harbour run from 4 to 5 knots.

CHAPTER XXII.

CAPE BRETON ISLAND; NORTH-EAST AND SOUTH-EAST COASTS.

VARIATION 23° to 26° West in 1860.

CAPE BRETON ISLAND, NORTH-EAST COAST.—The north-west coast of this island has already been noticed in pages 133–142. The north-east coast, from Cape North to St. Annes harbour, a distance of 47 miles to the south-west, is bold, mountainous, and free from outlying dangers, until near Ciboux island. The mountains attain the elevation of 1,390 feet above the sea, and are composed of primary and metamorphic rocks, principally granite, with clay slate, in nearly vertical strata. These rocks form the principal headlands; while sandstone, conglomerate, shale, limestone, and occasionally beds of gypsum and red and yellow marl occur on the intervening shores. These last named rocks, the lowest members of the coal formation, rest unconformably on the older rocks, and they are occasionally covered with beds of drift sand, red clay, and boulders; they are seen in the valleys, and are displayed on the eastern slopes of the mountains, where they form cliffs which are washed by the sea. They furnish, with the beds of drift, tolerably productive soil; supporting, with the aid of the fisheries, a thinly-scattered population.*

CURRENTS.—Notwithstanding the bold nature of this coast, wrecks have not been unfrequent upon it in the dense fogs which accompany the easterly winds. They have generally occurred to vessels running and steering, as they supposed, a safe course, to pass St. Pauls island into the Gulf of St. Lawrence. Unaware of, or not allowing for, the current so frequently found running out of the Gulf from the northward, and which had been acting upon their starboard bows for many hours, setting them many miles to the south-west of their reckoning, they ran on shore under full sail.

On one occasion this current was found running out of the Gulf for many successive hours, at the rate of 2 knots from the N.N.E.; at another time its rate was one knot from the N.N.W.; and at a third it was imper-

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* *See* Chart:—Gulf of St. Lawrence, Sheet 10, Cape Breton Island, with Views, No. 2,727; scale, $m = 0{\cdot}25$ of an inch.

ceptible. After long continued winds from the East or N.E., which raise the level of the water in the Bras d'or Lake and neighbouring harbours, it is not unusual to find a current of one knot running for several successive days along the land from off St. Anne to near Cape North, where it meets the current out of the Gulf, and is turned to the eastward with a great rippling. The fishermen affirm that it as often runs in the opposite direction; and again, that at other times there is a regular alternation of the flood and ebb streams.

These remarks are intended to show the inconstant nature of these currents, and the consequent great care required for the safety of a vessel when approaching this neighbourhood in the fogs which so often hide the lights on St. Pauls island.

ASPEE BAY is 8 miles wide and 4½ miles deep. On its north side, and distant 5¾ miles S.W. by W. from Cape North, is Wilkie Sugar Loaf, a remarkable conical hill 1,200 feet high.

To the southward of this, and occupying the head of the bay, are three Ponds with narrow entrances through sandy beaches, and into which boats can only pass at high water. The northernmost and largest of these Ponds has several islands in it, and a depth of 3 fathoms; it extends 3 miles inland, and has at its head a large brook called Aspee river. It has often a depth of 3 feet in its entrance after the melting of the winter's snows, but in summer seldom more than a foot at low water. There are settlements at all these Ponds, where fresh provisions and water may be obtained.

ANCHORAGE.—The best anchorage in Aspee bay with north-west winds is off the North Pond, in 8 or 9 fathoms, sand bottom; and with south winds off the South Pond, or in the cove under White Head, which, with a small island lying close off it, forms the south-east point of the bay. In this cove there is a settlement for prosecuting the fisheries, and good landing for boats in all but northerly winds. It is the anchorage generally preferred, especially by small vessels, as being the least embayed, and the most sheltered from the prevailing swell from the south-east. To vessels unable to beat round Cape North, or in want of supplies, this bay affords convenient anchorage; but it is only safe in fine weather, and with westerly winds: a vessel should therefore be in readiness to weigh instantly on the approach of a wind from the opposite quarter.

CAPE EGMONT, distant 12 miles to the southward from Cape North, is a comparatively low headland of granite, and nearly bare of trees. The coast there turns to the S.S.W., and at Neal and Blackbrook coves, which are distant 2½ miles and 4 miles respectively in that direction, there is good landing for boats. Off south point, between those coves, there is a

sunken rock lying 2 cables off shore ; and there is also a rocky shoal, with 2 fathoms least water, half a mile from the shore at Rocky bay, where there are several buildings, 2 miles to the northward from Inganish.

INGANISH BAY.—Inganish island is distant 10 miles from Cape Egmont, and half a mile S.E. from Archibald point, the north point of Inganish bay. The island is of rock, half a mile in diameter, and 206 feet high. The East rocks, 12 feet high, lie off it to seaward, and extend out to the distance of nearly 4 cables. There are several high rocks close to the outer shores of the island, and one small one off its south-west extremity at the distance of 160 yards. The north-west side of the island forms a small bay, in which there are several buildings, and where the small fishing vessels and boats are sheltered from the swell from the southward, and from all but easterly winds. From the west point of this small bay a spit and reef extend nearly half way across to Archibald point, leaving a channel of 18 or 20 feet in depth, but so narrow and crooked, that only 14 feet can be relied on at low water.

Inganish bay, between Archibald point and Cape Smoke (Cape Enfumé), is $3\frac{3}{4}$ miles wide, and $2\frac{3}{4}$ miles deep. It is divided into North and South bays by Middle head, a long, narrow, rocky, and precipitous peninsula, off which lies the Fisherman rock at the distance of a cable to the south-east. At the head of South bay there are two Ponds, having a common outlet, which boats can enter only at high water. There are several houses near these Ponds, as well as on the tongue dividing the two bays, and at some parts of North bay ; but the principal settlement of Inganish is on the north side of the bay, where, besides the establishment of Mr. Archibald on the inner side of the point, which bears his name, there is a small chapel, together with most of the houses and fish stages.

The mountains in rear of Inganish are the highest on this coast, attaining an elevation of 1,390 feet ; and Cape Smoke, its south point, rises precipitously from the sea to the height of 950 feet. The squalls from these highlands are at times very violent.

ANCHORAGE.—Vessels usually anchor on the north side of Inganish bay within Archibald point, shifting their berths as the winds may render necessary ; but the bottom is in general only a thin coating of sand over rock, and the anchorage consequently unsafe, especially with easterly winds, which send in a very heavy sea.

TIDES.—At Inganish, it is high water, full and change, at 8h. 11m. ; the rise in ordinary springs is 4 feet, and in neaps $2\frac{3}{4}$ feet.

The COAST from Cape Smoke to Bentinck point, a distance of $12\frac{1}{2}$ miles to the south-west, assumes a less sterile appearance ; the mountains

receding a short distance from the shore, so as to leave space for scattered farms. At a brook called French river, and especially at Breeding cove, there is good landing for boats. At the first named of those places the 30 fathoms line of soundings turns off to the south-east and passes outside the Ciboux shoal, thus affording sufficient guidance to those vessels that do not neglect the duty of sounding at night or in foggy weather.

In the next distance of $5\frac{1}{2}$ miles to Island point the shallow water extends 4 cables off shore, as it does also in the remaining distance of $3\frac{1}{2}$ miles to St. Annes harbour. At the distance of $1\frac{1}{2}$ miles past Bentinck point there are cliffs of white gypsum; and at Indian brook, one mile north from Island point, there is good landing. Island point looks like an island, but is a small wooded peninsula, joined to the main land by stony beaches inclosing McDonald Pond.

ST. ANNES HARBOUR (formerly Port Dauphin) is capable of containing any number of vessels in security; but the entrance is very narrow, with a tide of 4 knots; and there is a dangerous bar outside, over which a depth of 16 feet can be carried at low water with the aid of the Admiralty chart and these directions. Without such assistance, a stranger unacquainted with the leading marks could only safely rely on finding 12 feet.*

In a strong north-east wind, and especially when the tide is running out, the bar is covered with heavy breakers. The harbour is completely sheltered by Beach point, which is formed of large rolled stones and shingle, and reaches across from the northern to within 180 yards of the southern shore: it is quite bold at its southern extremity, and the entrance channel between it and Weed Pond shoal carries 13 fathoms water, but is only 130 yards wide. Within the entrance, on the north side of the channel, lies the Port shoal, of mud, extending half a mile in from Beach point, and just cleared to the southward by the line of Weed Pond beach and Bar point in one.

The North Arm, which boats can ascend to the distance of 3 miles in a N. by E. direction, will be seen by reference to the plan; as will also Monroe cove, with Shipyard rock in its entrance; and the gypsum cliff and the reef at Macleod point which divides the head of the harbour into two Arms. The Kirk stands near the head of a convenient boat cove on the south side of Macleod point, and near the manse, or residence of the minister, whose flock of highlanders form the greater part of the inhabitants of the harbour. They subsist by very indifferent farming,

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* *See* Plan of St. Annes Bay and Harbour, No. 2,033; scale, $m = 1\frac{1}{2}$ inches.

aided by occasional employment in the fisheries, and in getting out lumber for ship building.

On the eastern side of the entrance of the harbour, the small green mound of the old fort will be easily recognized: its summit forms with the plaster, or white gypsum cliff of Macleod point, in the head of the harbour, a leading mark for crossing the bar in the best water.

Immediately outside of Old Fort point, the stony Weed Pond beach commences, from which a rocky ledge, with 2 feet least water extends to the distance of 80 yards, and continues eastward to Bar point half a mile from the entrance. The marks for clearing this ledge, which is much in the way of vessels in this narrow channel and rapid tideway, are Lead-in point and Conway point in one: these are the two points next within Old Fort point, on the south shore of the harbour. Proceeding out along the southern shore, Wilhausen point will be easily distinguished, being the first point of cliff outside the entrance; and so also will Fader point, which is likewise a cliff, and just beyond the beach of Oyster Pond. These points are distant three-quarters and $1\frac{3}{4}$ miles respectively from the entrance, and, together with the objects previously mentioned, form the principal leading marks for entering or leaving the harbour.

Farther out, the south-eastern shore of the bay is quite bold all the way to Cape Dauphin, and the only remarkable object is Monroe beach and store, where there is good landing for boats with off shore winds.

Cape Dauphin, the dividing point between St. Annes bay and the Great Bras d'or, is a high and precipitous headland and the north-eastern termination of the range of mountains which separate them.

Water.—The best watering place is on the northern side of St. Annes harbour, $1\frac{3}{4}$ miles from the entrance, where a torrent descends a ravine in the mountains of St. Anne, which rise precipitously to the height of 1,070 feet above the sea.

DIRECTIONS.—Vessels bound to St. Annes harbour from the northward with a fair wind, should pass to the north-west of Ciboux and Hertford islands, avoiding, if it be wished, the rocky 6 fathoms fishing ground, in the mouth of the bay, by keeping well over towards Cape Dauphin. Go no nearer to the shore between Bentinck and Island points than the depth of 7 fathoms. Observe that the line of Bentinck point and Cape Smoke in one clears the shoal off Island point in 5 fathoms; and that in approaching the Bar, Cape Smoke should be kept open. Before arriving at the steep outer side of the Bar, which is distant one mile from the entrance, bring the white gypsum cliff of Macleod point in line with

the summit of Old Fort,* and steer for them until Fader point is seen only just open clear of Wilhausen point (the vessel will then be only about half a cable distant from the shore near Bar point); then port the helm instantly and run from the last named leading marks, keeping Fader point a little open, until Conway point is seen to the westward of Lead-in point, or until the gypsum cliff of Macleod point is open only half a point to the southward of Beach point, or until the latter bears S.W. by W., and is distant a quarter of a mile; then again alter course, and keeping Conway point in sight (to avoid Weed Pond ledge), steer so as to pass Beach point at a distance between 60 and 100 yards.

Having now entered the harbour, avoid Port shoal, by not opening out Bar point to the northward of Weed Pond beach, until the shingly Price point bears to the northward of N.W.; the vessel will then be within the shoal, and may haul to the northward, and anchor to the westward of it, in 8 fathoms, mud, and out of the stream of the entrance. But the best-sheltered anchorage is in the entrance of the North Arm; the riding elsewhere in so large a harbour being at times rather rough for a small vessel. The north-east gales, on entering this harbour, between mountains 1,000 feet high, and only 2 miles apart, blow with concentrated force. They may be expected at any time after the middle of August, and a vessel should be well moored to withstand their fury.

TIDES.—Within St. Annes harbour the time of high water, full and change, is 8h. 42m, and ordinary springs rise 5 feet, and neaps 3¼ feet. Extraordinary tides rise 6 feet.

It is high water 10 minutes earlier on the Bar, and the rise is there less by about one foot. The rate of the tidal streams in the entrance is from 3 to 4 knots.

HERTFORD and CIBOUX ISLANDS lie off Cape Dauphin in a straight line N.E. by E.; and, including the Ciboux shoal, extend to the distance of 4½ miles. They are long and narrow islands of sandstone, precipitous on every side, nearly bare of trees, and half a mile apart. There is no passage for ships between them, but boats, or small craft, can pass through a narrow channel, which is distant from half to a cable's length from Hertford island, and between it and the middle rock.

Hertford island is the highest, and 100 feet above the sea. It is distant from Cape Dauphin 1½ miles; but the dangerous Hertford ledge,

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* If the gypsum cliff of Macleod point cannot be made out, pass Wilhausen point, at the distance of one or 1¼ cables, steering for the Old Fort, until Fader point is only just open; then proceed as already directed.

which has 5 feet least water, extends from it nearly half way across to the cape, leaving a channel 6 cables wide, and carrying 7 or 8 fathoms water. To avoid this ledge, vessels should keep well over towards the cape, from which the shallow water does not extend beyond the distance of 2 cables.

From the outer point of Ciboux island a reef runs off half a mile to the N.E. by E.; and the dangerous Ciboux shoal, with 15 feet least water, and on which the sea at times breaks heavily, lies five-eighths of a mile farther out in the same direction.

The GREAT BRAS D'OR is the principal of the two channels, on either side of Boulardrie island, leading to the interior sea, called the Bras d'or Lake. Its entrance, between Carey point and Noir point, is only 340 yards wide, with deep water; and, at a short distance outside, the channel is still farther contracted by shoals to 220 yards, measuring from the depth of 3 fathoms on either side.*

Within the entrance, off the small bight between Duffus and Mackenzie points, lies the Eddy rock, with one foot least water. A vessel will pass clear to the westward of it by keeping Blackrock point open to the northward of Noir point. On the opposite or northern side of the channel, from Carey point to Kelly cove, a distance of one mile the shore is quite bold.

Off the mouth of Kelly cove, in 5 or 6 fathoms over a bottom of sand, the anchorage is good, and out of the strength of the tide; but it is still more secure farther in, within a cable's length of its head, where the bottom is of mud, and the depth 3 to 4 fathoms.

To this cove, which is a convenient anchorage, we shall restrict our present notice of the Bras d'or, the object of this chapter being the eastern seaboard of Cape Breton island, leaving the description of its noble inland waters to the next chapter (page 214).

Carey point, the north-west side of the entrance of the Great Bras d'or, is a shingle beach, quite bold at its southern extremity, but having a dangerous shoal running out from it E.N.E. so as to form the northern side of the channel outside for seven-eighths of a mile. On many parts of this shoal the depth is only 3 feet at low water, so that it is shown by breakers when there is any sea running; and a wide bar commences immediately outside of it, and continues a mile farther out, with irregular soundings, from 3 to 6 fathoms, over gravel and sand bottom. The shallowest part, 3 fathoms, called the Middle shoal, lies on the north side of the channel, and $1\frac{1}{2}$ miles from Carey point. Nearly opposite to this, and on the

* *See* Plan of Little Bras d'or Lake, and St. Anne and Sydney Harbours, No. 2,687; scale, $m = 0{\cdot}9$ of an inch.

south side of the channel, is Blackrock shoal, extending 2 cables north from the red cliffs of Blackrock point, and half a mile in a north-east direction.

These are the principal dangers of the entrance; they render the channel indirect as well as narrow; and together with the rapid tides, and the want of buoys and beacons, make this a very dangerous pass for a stranger to attempt, except under favourable circumstances of weather, wind, and tide. Farther out, it is only necessary to observe, that the shallow water extends $1\frac{1}{2}$ cables off Table islet, which will be seen lying close off the cliff of Table head, and distant 3 miles from the entrance.

The Haddock bank has 4 fathoms least water, and lies from 1 to $1\frac{1}{2}$ miles off shore midway between Table head and Cunet point: the last being the remarkable north-east extremity of Boulardrie island, formed of cliffs of the coal formation, which are fast yielding to the waves; and from which a rocky shoal extends to the distance of two-thirds of a mile.

Supplies.—There are houses and farms on either side of the entrance of the Great Bras d'or, at which supplies of fresh provisions may be obtained; water is easily procured.

DIRECTIONS.—If the entrance of the Great Bras d'or channel were buoyed, a large ship might back and fill in against the wind, with the aid of the strong tide; but without that guidance, a fair wind, and weather clear enough to allow the leading marks to be seen, are indispensable.* Having those requisites, proceed as follows: observing first, that Duncan head, 4 miles within the entrance, shows like a well defined point on the south-east side of the channel. Pay a due regard to the dangers which have been pointed out, off the points of the bay: and before advancing farther in than Table island, bring Carey point and Duncan head to touch, bearing S.W. by W. $\frac{1}{2}$ W.; and steer for them until Cape Smoke and the north end of Hertford island are in one; then alter course to the southward and keep those marks in one astern, running from them (for about $1\frac{1}{2}$ or 2 cables) until Mackenzie and Duffus points come in one, when steer S.W. by W. $\frac{1}{2}$ W. for them, or so as not to open out Mackenzie point until Blackrock point and Table head come in one.

These last named well defined points kept in one astern, or as the vessel runs from them, on a W. by S. $\frac{1}{2}$ S. course, will lead nearly in mid-channel through the narrow entrance between Carey and Noir points: after which there is nothing in the way of a vessel hauling up for Kelly cove. Should, however, the strong flood tide carry her above the cove, she will find good anchorage 2 miles farther in on the same side, in 5 fathoms, and to the westward of Jane point.

* *See* Enlarged Plan of the Great Bras d'or, on Plan, No. 2,687.

If the weather should be so hazy that Cape Smoke cannot be seen, run in upon the S.W. by W. $\frac{1}{2}$ W. course, with Carey point and Duncan head touching, until Blackrock point is abeam; then sheer to the southward until Mackenzie and Duffus points come in one, and proceed as before directed.

TIDES.—It is high water, full and change, at the entrance of the Great Bras d'or channel, at 7h. 30m.; the rise in ordinary springs being 3 feet, and in neaps $1\frac{2}{3}$ feet. The usual rate of the tidal streams in the entrance is from 4 to 5 knots; but in the spring, or after long continued north-east gales, which have previously raised the level of the Bras d'or Lake, they may amount to 6 knots. They form strong ripples and eddies, especially off Carey point.

In fine settled weather the stream runs out until half an hour before high water by the shore; and in, until half an hour before low water; but strong winds cause great irregularities. It will be observed, therefore, that the stream runs out nearly all the time the water is rising; and in nearly all the time it is falling.

The rise of the tide diminishes rapidly within the Bras d'or, and beyond Barra Strait it becomes nearly or altogether insensible.

ASPECT of COAST.—The Great Bras d'or channel, separating the coal-bearing strata of Boulardrie island, and the country farther to the south-east, from the older rocks, forms the boundary of a great change in the character of the coast. Instead of mountains the coast is now of moderate elevation, characterized by cliffs of sandstone and shale of the coal formation, until we arrive at older rocks on the south shore of Mira bay, and at Scatari island; the latter being distant from the Great Bras d'or, 36 miles.

CAUTION.—The dangers of this coast are such as to render great caution necessary at night or in fogs, when 30 fathoms, or at least 20 fathoms water, is as near as a stranger should approach; the latter depth being in some parts within 2 miles of the shore.

The LITTLE BRAS D'OR is the narrow and winding passage on the eastern side of Boulardrie island; which, at the distance of 5 miles from its entrance, expands into the wide and deep channel of St. Andrew.

This passage can only be entered by small craft and boats under favourable circumstances, the entrance being closed with breakers when there is a heavy sea running, and especially when the strong tide is running out against the wind. The depth at low water, over the rocky bar, is 7 feet, in a channel between reefs, and only a quarter of a cable wide. There is a fishing establishment on the shingle point just within the entrance, and scattered houses and farms on either side.

TIDES.—In the Little Bras d'or passage it is high water, full and change, at $7\frac{3}{4}$ hours; and ordinary springs rise 3 feet, and neaps 2 feet. The usual rate of the stream in the entrance is 4 knots.

BIRD and BONAR ROCKS.—The approach to the Little Bras d'or passage is rendered dangerous to strangers by the shoals on the east side of Cunet point, extending 6 cables off shore; and by the reefs off Alder point and Mope head to the east of its entrance.

The Bird rock, 6 feet high, will be seen on the reef, lying 4 cables S.E. from Mope head; and the Bonar rocks dry at low water, at the same distance off Bonar head. There is also a rocky shoal off Katon Pond, the least water on which, 3 feet, bears from Lawler point N.E. by N., nearly 6 cables. In addition to these dangers, observe that, in the distance of 6 miles from Cunet point to Cranberry head, the shoal water for a vessel of large draught frequently extends to nearly a mile off shore.

SYDNEY HARBOUR is one of the finest ports in the world, being equally easy of access and egress, and capable of containing any number of the largest vessels in safety. It is 3 miles wide at the outer entrance; but the navigable channel contracts rapidly to the breadth of half a mile between the two bars, which are of sand and shingle, and extend from the shore on either side, at 5 miles within the lighthouse on Flat point. Inside of these bars the harbour divides into the West and South Arms; the former being open to E.N.E. winds, except at the Coal Loading ground, where vessels anchor under shelter of the N.W. Bar; and at North Sydney, where they may lie in like manner under Allen point.*

The South Arm, being completely sheltered from the sea by the S.E. Bar, affords safe anchorage in every part. The town of Sydney, $3\frac{1}{2}$ miles up this Arm, is exceedingly well situated on the west side and summit of a peninsula 55 feet high. It has deep water close to its wharves, and the Arm continues navigable for vessels to Sydney bridge, a distance of 2 miles; and for boats to Forks bridge, where the tide ends 6 miles above the town, and from which a road leads across to the East bay of the Bras d'or.

The town of Sydney is small, the population (in 1849) not exceeding 500 souls, its increase having been greatly retarded by the transfer of the seat of Government consequent upon the annexation of the island to Nova Scotia. It is, however, still the principal town, containing barracks where a small garrison is stationed, a court-house, an academy, a church, and two chapels. Occupying a site of great beauty, in the best sheltered part of the harbour, where alone any considerable number of large vessels could winter afloat in security; and having a fertile country in its imme-

* *See* Plan of Sydney Harbour, with View, No. 2,042; scale, $m = 2{\cdot}3$ inches.

diate neighbourhood, there seems every reason to think that it must ultimately increase with the increasing wealth and population of the island. At present the principal business is carried on at the Coal Loading ground, within the N.W. Bar, where the railroad from the mines terminates; where a fast increasing village is springing up, and where the numerous vessels from the United States and the Colonies anchor, and take in their cargoes of coals. Surrounded by a productive country, rich in coal and iron, and with inexhaustible fisheries in the immediate neighbourhood, this harbour cannot fail to become of great importance in a generation or two.

The only drawback is the lateness of the spring; the advance of summer being retarded by the cold winds from the neighbouring sea, which is usually, until late in May, laden with drift ice, large masses of which are frequently driven into the harbour by the north-east winds. In the year 1856 the total value of imports was 7,045*l.*, of exports 24,972*l.*

Water.—The most convenient watering place is at the creek, which discharges the waters of the Sawmill lake, a short distance to the westward of the Coal Loading ground; but good water may be obtained on the east side of the South Arm, also opposite the town of Sydney, and in several other places where brooks enter the sea. The country is well settled around the harbour, and supplies of every kind may be readily obtained.

LIGHT.—The lighthouse on Flat point, on the east side of entrance to Sydney harbour, is octagonal in shape, 51 feet high, painted red and white, vertically.* It exhibits at 70 feet above high water a *fixed white* light, which is visible in clear weather from a distance of 14 miles.

After passing to the westward of the lighthouse, on entering the harbour, the high and conspicuous colliery chimneys, the churches, together with the other buildings at the mines, will be seen on the opposite shore, at the distance of $1\frac{1}{2}$ miles within the cliffs of Cranberry head; as will also the churches, with the stores, houses, and wharves at the Coal Loading ground, which is 2 miles farther in along the same side of the harbour.

DIRECTIONS from the NORTHWARD.—When approaching Sydney harbour from the northward, with a leading wind, steer so as to pass the reef off Cranberry head (on which lies the Cran rock, with 16 feet water, half a mile off shore), in the depth of 10 fathoms; and when the high cliff of Mines point opens out to the eastward of Swivel point, haul into the entrance. If bound to the Coal Loading ground, run along the north-west shore, in not less than 5 fathoms water, until past Mines point, then steer to the southward, sufficiently to bring Jackson and Allen points (two shingle

* *See* View on Plan.

points up the West Arm) in one; or until the lighthouse comes in line with Petre point; either of which, or at night the depth of $6\frac{3}{4}$ fathoms, will lead clear of the N.W. Bar, which is very steep, having $5\frac{1}{2}$ fathoms close to. When the wharves at the Loading ground bear N.W., the vessel will be well within the bar, and may haul in, and choose her berth in 5 or 6 fathoms, mud bottom, and at the distance of $1\frac{1}{2}$ or 2 cables from the wharves.

If the vessel be bound up the South Arm, run in as before, or in mid-channel, until the easternmost of the high colliery chimneys appears to the westward of the easternmost church on Mines point; then run from those marks, keeping the easternmost chimney a little open to the westward of the church, and they will lead clear of the S.E. Bar, the western extreme of which will be passed, when the west point of its shingle beach begins to bear to the northward of East. The vessel may then either haul to the eastward, and anchor in Fishery cove, in 6 or 7 fathoms, mud bottom, or proceed on to the town of Sydney. In the latter case, it will only be necessary to consult the chart for the extent of the shallow water of either shore, not failing to observe that the reef extends N. by E. a quarter of a mile off Battery point. The anchorage is good anywhere off the wharves of the town, if outside a line joining the English church and Shingle point, within that line there being shoals, as will be seen in the chart. The depth at this anchorage is from 5 to $8\frac{1}{2}$ fathoms, over mud bottom; and there is sufficient depth for large vessels all the way to the bridge, between which and the town is the most secure part of the harbour.

From the EASTWARD.—When approaching the harbour from the eastward, pass the lighthouse no nearer than half a mile, or in not less than 7 fathoms water; and to avoid Petre the reef (dry at low water, a mile within the lighthouse), do not haul into the harbour until Daly point opens out to the northward of Gillivray point; and to clear the shoal at Petre point, and farther in, do not approach nearer than half a mile, or than the depth of $5\frac{1}{2}$ fathoms, in running along the eastern shore. When the lighthouse and Petre point come in line, keep them so as the vessel runs from them, and they will lead to the Loading ground as before. If bound up the South Arm or to Sydney, run with the lighthouse and Petre point in line, or with the former only just shut in, until the marks for clearing the S.E. Bar, namely, the eastern colliery chimney and the easternmost church on Mines point come in line, when proceed as before directed.

In beating into this harbour great care must be used, especially when between the N.W. and S.E. Bars, both of which are so steep, that the lead will afford little or no warning. There is, however, plenty of room;

and with the aid of the Admiralty chart, the intelligent seaman will experience no difficulty even in the largest ship.

TIDES.—It is high water, full and change, at the S.E. Bar, and also at the town of Sydney, at 8¼h. ; the rise at ordinary spring and neap tides being, at the bar, 3¾ feet and 2⅓ feet respectively ; and at the town 5 and 4 feet. The ordinary rate of the streams is half a knot off the town, but much weaker farther out in the wider parts of the harbour.

INDIAN BAY, at 5 miles to the south-east of the lighthouse on Flat point, is open to the wind and swell from the eastward, and therefore affords a safe anchorage only in off-shore winds and fine weather. It is 3 miles wide and 1½ miles deep. At its head, a dry sand-bar, a mile long, extends across from the southern to within three-quarters of a cable of the northern shore, leaving an entrance of that breadth into Bridgeport harbour, which is a shallow pond extending 2 miles inland. The depth of 8 feet at low water is all that can be carried into this harbour, the interior of which is occupied by flats of sand and weeds, partly dry at low tide ; except in a narrow and winding channel, having 7 to 15 feet in it, and which leads into a wide expansion carrying 8 feet at low water.

Coal Mines.—The mines at Bridgeport, on the south side of Indian bay, were formerly worked, and the coal conveyed by a railroad along the dry sand bar to a wharf at its northern extremity ; but the shallow and narrow entrance, admitting only small vessels, and the unsafe anchorage outside, have caused these works to be abandoned for the present. The coal is said to be of excellent quality and easy of access ; it is, therefore, probable that these mines will be resumed hereafter, and the coal conveyed by railroad across to the South Arm of Sydney harbour for shipment.

DIRECTIONS.—In approaching Indian bay, in order to anchor, give its points, which are cliffs of the coal formation, a berth of full half a mile, or pass them in not less than the depth of 5 fathoms ; and observe that shallow water extends to the same distance from the north shore and head of the bay, as well as farther eastward towards Table head.

The best anchorage is near the middle of the bay, and within the depth of 5 fathoms ; in greater depths the bottom is in general rocky, and not to be trusted.

TIDES.—It is high water, full and change, in the entrance of Bridgeport harbour at 8h. ; and the rise is from 3¾ feet to 2⅓ feet, accordingly as it may be spring or neap tides. The ordinary rate of the stream in the entrance is 2 knots.

GLACE BAY, 5 miles farther to the south-east, affords no safe anchorage. At its head is Dyson Pond, extending 2 miles inland, and

having a narrow outlet, through sand hills and sand-beach which is usually dry at low water. On the north-west side of this bay, at Glace cove, the shallow water extends three-quarters of a mile off shore; and on the opposite side, at Macrea and Dyson points, the reefs run out fully half a mile from the cliffs.

CAPE PERCY, at 4 miles farther to the eastward, is a precipitous headland, where the cliffs of coal-bearing sandstone rise 110 feet above the sea. Off its north side lies Schooner rock, with 5 feet least water, being the shallowest part of a reef which extends 4 cables from the shore. The Percy rock, with 7 feet water, lies 2 cables off the north-east shoulder of the cape.

FLINT ISLAND, bearing E. by S. $1\frac{6}{10}$ miles from Cape Percy, is of sandstone, broken by the waves, precipitous, 60 feet high, and 3 cables long, in an E. by N. direction. On its north point there is a fish store where alone boats can land. Shallow water extends only a third of a mile from it in any direction; but off its west end, to the distance of 4 cables, there are very irregular soundings, $4\frac{1}{2}$ to 12 fathoms in a cast of the lead, which cause, with the tide, a strong rippling, and at times a heavy breaking sea.

Between these dangers and the cape there is a clear channel a mile in breadth, through which an irregular tidal stream runs at times 2 knots.

LIGHT.—The lighthouse, erected on the north-east end of Flint island, exhibits at 65 feet above high water a *fixed white* light, which shows a bright *flash* every *fifteen seconds*, and is visible in clear weather from a distance of 12 miles.

MORIEN BAY.—At Cape Percy the direction of the coast changes from S.E. to S.S.W., and continues in the latter direction for about 14 miles, across the mouths of Morien and Mira bays to Cape Breton, the eastern extremity of Cape Breton island. Morien or Cow bay is $2\frac{1}{2}$ miles wide at its entrance, between Capes Percy and Morien. On its north side, just within Cape Percy, lies Cow reef, dry in part at low water, and extending to half a mile from the shore. The head of the bay is occupied by flats of sand and mud, partly dry at low water, and through which a narrow and shallow channel leads to False bay beach, on the north side of Mira bay. Being completely open to easterly winds, Morien bay affords no safe anchorage.

Cape Morien is a bold headland, the shoal water extending only $1\frac{1}{2}$ cables from its sandstone cliffs, which abound in coal, and rise on its south side 150 feet above the sea. It is the north-east extremity of a peninsula, which forms the precipitous north shore of Mira bay, for a

distance of 5 miles, and terminates at the shingle isthmus of False bay beach.

MIRA BAY is also open to winds from the eastward, and affords no safe anchorage. It is of great extent, stretching in 9 miles to the westward of Cape Morien, and being $7\frac{1}{4}$ miles wide at the entrance between that cape and Moque head. The Mira river, after flowing for several miles between precipitous banks, enters the head of the bay between points of sand and shingle, 80 yards apart. It discharges the waters of the Mira lake and Salmon river, and is the outlet of an interior navigation of about 20 miles; but the ordinary depth on its bar of sand and stones is only 4 feet at low water, and seldom exceeds 8 feet, except in extraordinary spring tides.

Catalogne lake has only one foot at low water in its very narrow outlet, through a sand and shingle beach, 2 miles south of the Mira river. It is broken into coves, peninsulas, and islets, forming picturesque scenery. There is a church at its head, 3 miles in from the entrance, and its shores are occupied by farmers and fishermen.

Mira bay, and probably the valley of its river and lake, define another very remarkable change in the character of the coast and nature of the country. Instead of the undulating and comparatively fertile land, and the long ranges of sandstone cliffs, abounding in coal, which form the north side of the bay, the country to the southward, including the island of Scatari, is all hummocky land, in which small round or conical hills rise from among swamps, shallow ponds, and dwarf spruce trees.

The slates, sandstones, and conglomerates of this country appear to be subordinate to the coal formation; they are greatly shattered, and frequently altered by the abounding trap rocks, and the only parts that appear susceptible of cultivation are isolated hills of drift sand, clay, and boulders.

MENADOU HARBOUR, on the north side of Menadou bay, three-quarters of a mile within Moque head, is a semicircular cove, a quarter of a mile wide. Its shingle beach is occupied by fish stages, and its shores by a busy village of fishermen and small traders. It has two chapels, one of which is distinguished by a steeple; and the population, including those scattered around the bay, amounts to about 300 souls.

The depth at low water in this small harbour is from 10 to 14 feet, over sandy bottom. It is sufficiently sheltered by the numerous rocks in the bay, and by the island of Scatari, to afford safe anchorage to fishing schooners and coasting vessels, drawing less than 10 feet water; but larger vessels would be endangered by the swell or *under tow* which accompanies gales from the eastward, and which would cause them to

strike the ground at low water. The approach to the harbour, between numerous rocks above and under water, is so difficult and dangerous, that no written directions could avail; the plan of the bay, or the assistance of a fisherman of the place, would be indispensable to any stranger.*

TIDES.—It is high water, full and change, at Menadou, at 8¼h.; the rise in ordinary springs is 5½ feet, and in neaps 3⅓ feet.

The MENADOU PASSAGE is a mile wide between Moque head and the west point of Scatari island, and has a clear deep-water channel of nearly half that breadth in the narrowest part, which is between the Great and Little Shag rocks in the northern part of the entrance. Nevertheless, it should only be used in cases of emergency, or in such circumstances of wind and weather as would insure the not being surprised by the prevailing dense fog, in a channel rendered indirect by numerous dangers, destitute of good holding ground, and in which there is no shelter from the heavy sea which accompanies all easterly and southerly winds. The principal dangers in this passage are the Shag rock and Bar reef, the other rocks in the mouth of Menadou bay being less in the way of vessels.

Shag and Cary Rocks.—The Shag rock is black, 60 yards long and 15 feet high; it will, therefore, readily be seen; but a rocky shoal extends from it 4 cables E.N.E., and nearly 2 cables E.S.E. In this latter direction there is a patch with 12 feet least water on the extreme edge of the shoal. The Little Shag and the Cary rocks, half a mile to the eastward of it and nearly three-quarters of a cable off shore, can also be seen, being small black trap rocks, respectively 6 and 4 feet above high water. The Little Shag lies 1½ cables north from the west point of Scatari, and the shoal water outside of it does not extend beyond the distance of half a cable, leaving a clear channel 4½ cables wide, and with 9 fathoms water between it and the Shag shoal.

Neering, Duck, Dick, and Black Rocks.—This latter is the main channel, that to the west of the Shag being rendered dangerous by the Neering rock, which, with 9 feet least water, lies 3½ cables N.W. from the Shag rock; also by the Duck rock awash at high water, and lying 1¾ cables South from Moque head; and by the Mad Dick, which, with 3 feet least water, lies 2 cables farther to the S.W. To these dangers, on the west side of the channel, may be added the Black rock, which can always be seen, and the other rocks in the mouth of Menadou bay, but they are out of the way of passing vessels.

The Bar Reef, which runs out from Bar point to the southward of Menadou bay, and more than half way across to the island of Scatari,

* *See* Plan of Scatari Island, No. 2,730; scale, $m = 4$ inches.

was formerly a dry bar covered with sand and grass; at present the only part uncovered at high water is the Bar Stone, a single mass of rock, about 4 feet high, but at low water the reef still dries extensively, and completely shelters Menadou from the south wind and swell. The Bar Stone lies three-quarters of a mile off shore, and the reef continues a quarter of a mile farther out towards the west point of Scatari, which it approaches to within three-quarters of a mile, and then turns to the south-east.

In this last-named direction the Bar reef continues three-quarters of a mile, and terminates at the Helen rocks, in only 4 and 6 feet at low water, on which the sea often breaks heavily. The eastern extremity of this dangerous reef, in 5 fathoms, bears S. by W. $1\frac{1}{8}$ miles from the west point of Scatari, and N.N.E. 2 miles from Cape Breton. A line from one of those points to the other passes over the east end of the reef in 6 feet at low water; and vessels will pass to the eastward of it, if Portnova island be not entirely shut in behind Cape Breton.

Hatch and Ragged Rocks.—On the opposite side of the Menadou passage, the reefs off the south-west side of Scatari can always be seen, and do not extend more than 2 cables off shore. The Hatch rocks and Ragged rocks need only to be mentioned here; the former being most in the way, will be cleared, as long as the Shag rock is not shut in behind the west point of Scatari.

CAPE BRETON, the extreme eastern point of Cape Breton island is low, rocky, and covered with grassy moors. It is bold to the eastward, with the exception of a rocky 12 feet patch bearing S.S.E. $\frac{1}{2}$ E. a quarter of a mile. On the north side of the cape, at three-quarters of a mile, lies Lansecoin island,* in the mouth of a shallow bay. This island, which is about 2 cables in diameter, and 50 feet high, is bold to seaward; but a rock, dry at low water, lies between it and the cape.

Portnova† island lies off the south side of the cape, from which it bears S.S.W. $\frac{1}{2}$ W. three-quarters of a mile. It is rocky and precipitous, $1\frac{1}{2}$ cables in diameter, and 50 feet high. It is bold to seaward, with the exception of a rock with only 12 feet water lying $3\frac{1}{4}$ cables from its south-west side; but the Chameau rock, which is awash, and on which a French frigate was lost, lies nearly midway between it and the cape, leaving no passage for ships.

DIRECTIONS.—The Menadou passage has hitherto been considered too dangerous for any but fishing and coasting vessels; but with the aid

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* From L'Ance au Coin.

† From Puerto Nuevo, a very inapplicable name, there being no port near.

of the Admiralty plan, and the description and directions here given, the largest ship may take it without danger, in case of need, and under favourable circumstances of wind and weather. All southerly and easterly winds are unfavourable, because either accompanied by or liable to the sudden arrival of dense fogs. Winds between West and North are as constantly free from fogs, and being, moreover, smooth water winds, are favourable for this passage.

A vessel approaching from the southward with a westerly wind, and wishing to avoid running to leeward outside of Scatari, should pass Portnova island and Cape Breton at the distance of half a mile or more, steering for a remarkable hill called Steering Hummock, which rises 6 cables to the eastward of the west point of Scatari. Take care not to shut in Portnova island behind Cape Breton, until sure that the Bar reef has been passed; and when the west point of Scatari bears a point or more to the westward of North, steer so as to round it at a distance between a quarter and half a mile, keeping gradually away to the northward and eastward, so as to pass between the Little Shag rock and the Shag shoal. When the Little Shag rock comes in one with the west point of Scatari, or when the latter bears to the westward of South, the Shag shoal will be past, and a course may be shaped for Cape Morien.

If coming from the northward, with a fair wind, bring the west point of Scatari to bear to the westward of South, and steer for it until the eastern extremity of the Shag shoal is past, which will be when the Shag rock and Moque head come in one; then alter course so as to pass the Little Shag and the west point of Scatari at the distance of 2 or 3 cables; which having done, steer out to the S.E. by S., remembering the marks for clearing the Hatch rocks and the east end of the Bar reef.

TIDES.—The ordinary rate of the tidal streams in the Menadou passage is from 1 to 2 knots, the flood from the southward, and the ebb in the opposite direction; but they are often very irregular.

SCATARI ISLAND, forming the extreme eastern dependency of Cape Breton island, is in shape a triangle, the longest side of which faces the north, and extends $5\frac{1}{2}$ miles; while a line at right angles to it, and terminating at Howe point, the southern extremity of the island, gives an extreme breadth of $2\frac{1}{2}$ miles.

The natural features of this island are similar to those of the adjacent mainland, the highest hill rising 190 feet above the sea. It is not permanently inhabited, being reserved by the colonial government, but is much frequented by the fishermen in the summer season. Near the centre of its northern shore is the North-west cove, affording a smooth water anchorage in southerly winds; but the holding ground is not good,

and vessels should be prepared to weigh promptly with the change of wind. The south-west and south-east sides of the island are broken by the heavy and almost incessant Atlantic swell into rocky points and coves, which afford excellent fishing stations, but no shelter to shipping.

Eastern harbour, formed by Hay island on the south side of the east point of Scatari, does not deserve the name, being merely a very insecure anchorage within the reefs ; but it is used occasionally in fine summer weather by small vessels employed in the fisheries, and in saving things from wrecks.

LIGHT.—The lighthouse on the north-east point of Scatari island is octagonal in shape, painted white, and 70 feet high. It exhibits, at 90 feet abovethe sea level, a *revolving white* light, which is visible *a minute* and *eclipsed half a minute.* In clear weather the light should be seen from a distance of 15 miles. The lighthouse is furnished with a gun for signals, and a boat to assist vessels in distress.

DANGERS around SCATARI ISLAND.—The reefs off the south-west side of Scatari have been already mentioned (page 203) as extending only 2 cables off shore ; those off the north side are still shorter. The principal dangers are on the south-east side, where a reef runs out half a mile from Hay island. Outside of this, and bearing South $1\frac{1}{8}$ miles from the lighthouse, lies the Wattie rock, with 4 fathoms on it at low water ; and still farther out, and bearing S. $\frac{1}{2}$ E. $1\frac{1}{2}$ miles from the lighthouse, there are two rocky patches, 5 fathoms, on which the sea occasionally breaks.

The Cormandière rocks lie nearly three-quarters of a mile to the eastward of the lighthouse. They are small black trap rocks from 6 to 16 feet high, and can therefore always be seen. They are bold to seaward, and there is no passage between them and the lighthouse for ships.

Scatari, like St. Pauls island, has become celebrated for many fatal shipwrecks ; but these casualties, (which have been mainly occasioned by the neglect of the lead, in vessels bound for the Gulf of St. Lawrence, and meeting the prevailing current on the starboard bow,) have been greatly diminished since the establishment of the light in the year 1839.

CAPE BRETON ISLAND ; SOUTH-EAST COAST.*

ASPECT of COAST.—From Cape Breton to Cape Gabarus, a distance of 15 miles to the W. by S. the land is of moderate height, and the shore

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* The description and directions from Cape Breton to Michaux point are by Commander J. Orlebar, R.N., April 1859.

broken into coves and small harbours, with some hummocks in the back ground, rising to the height of 200 feet. The north coast of Gabarus bay is steep, the hills 200 feet high, rising abruptly from the shore; on the south coast the land is much lower.

From Cape Gabarus to Michaux point, the land is low and has a barren and rocky appearance, the woods having recently been burned, and the shore is broken into numerous lakes and ponds, protected from the sea by beaches of gravel and some small rocky islands and ledges. Occasionally there are reddish clay cliffs, 70 to 90 feet high, but at a distance from the land there are no remarkable features to be easily recognized by a stranger.

The prevailing rocks are clay-slate and trap, with overlying hills of drift-clay and boulders. Much of the land is poor and swampy, but the hills of drift-clay repay cultivation; the shores are thinly settled by a hardy and industrious people, whose houses are seen in the bays and coves most convenient to the fishing ground.

The only safe harbour on this coast is Louisburg, which is distant 8 miles from Cape Breton; the intermediate shore possesses three small harbours, Baleine, Little and Big Loran, too intricate and rocky in their entrances to admit vessels of any burthen, but affording excellent fishing stations.

To the westward of Cape Gabarus the 30 fathoms line of soundings is distant 4 miles from the shore, but the bank of soundings again contracts off Santésprit island, and at 2 miles from the shore the depth is 40 fathoms. On this account in foggy weather the lead should, on no account be neglected, and no part of this coast approached nearer than the latter depth.

About 3 miles off this coast a current is often experienced running nearly one knot per hour to the W.S.W.; nearer the shore it is much less constant.

LOUISBURG HARBOUR.—Louisburg, once the principal seat of the French power, contains now only a few scattered houses, and the ruins of its walls may still be traced on the west side of the harbour. Its population of 250 persons is principally employed in the fisheries; but all cultivate small farms. The land affords good pasturage, and small supplies of fresh provisions may be generally purchased. Good water may be obtained from a brook near Gerald head, on the western shore of the harbour. There are two churches on the north side of the harbour, but from sea they are not easily distinguished.*

* *See* Plan of Louisburg Harbour, No. 2,692; scale, $m = 4$ inches.

This harbour although small is favourably situated, and may be recognized by its lighthouse, which stands on the north-east point of entrance. The only well sheltered anchorage is in the north-east cove, the western part of the harbour being much exposed to the ocean swell. The harbour has but little trade, but being easy of access, is a favourite resort of the coasting vessels frequenting Sydney for coal. There are no branch pilots, but any of the fishermen are well qualified to bring vessels into the harbour.

The only navigable entrance to the harbour is about 2 cables wide, and being exposed to the ocean swell, should not be attempted by vessels of large draught, except with a leading wind, as the shoals on either side are of rock, and the wind often baffling and unsteady. There is no channel between the islands forming the south-west side of the entrance; and at low water Fort island is so nearly joined by a rocky ledge to Rochford point as to leave only a boat passage.

LIGHT.—The lighthouse standing on the north-east point of entrance to Louisburg harbour is 35 feet high, and painted white with a vertical black stripe.* It exhibits, at an elevation of 85 feet above high water, a *fixed white* light, visible in clear weather from a distance of about 16 miles.

Harbour Shoal, with 5 fathoms water, lies off the entrance to Louisburg harbour, E. by N. half a mile from Green island, and only breaks in very heavy weather; there are reefs extending $1\frac{1}{4}$ cables in an easterly direction from Rocky and Fort islands.

The north shore of the entrance to the harbour is bold to, except S. by W. from the lighthouse, and a cable from the shore, where there is a rock with 4 fathoms on it.

Nag Rock and Battery Shoal.—The Nag rock, lying W.N.W. 4 cables from the lighthouse, is only awash at the lowest springs. It has some rocky ground about it, all which may be cleared in entering the harbour by not shutting in Loran head behind Lighthouse point bearing E. $\frac{1}{2}$ S. The shoal extending N. by E. about $3\frac{3}{4}$ cables from Rochford point wide be also cleared by keeping Loran head and Lighthouse point in line.

The Battery shoal, lying half way between Battery and Careening points, has 3 fathoms least water on it; a vessel will pass to the southward of it by keeping Scott point open of Careening point.

DIRECTIONS.—A vessel bound to Louisburg harbour from the northeastward, after rounding Portnova island, (south-west from which, at the distance of $3\frac{1}{4}$ cables, is a rock with only 12 feet water, page 203), may approach the coast towards Louisburg within half a mile, except off Wild cove, when the lighthouse at the entrance of the harbour must be kept

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* *See* View on Plan.

well open of Loran head, or, about W. by N., to avoid the White rock with 18 feet, and the Wild cove shoal with only 8 feet water, which lie a long mile from the nearest shore; also the Loran rock, with 10 feet water, lying S.S.E. 2 cables from Loran head, which is a rocky bluff, 70 feet high.

To enter the harbour with a leading wind, bring the lighthouse on any bearing from N.N.W. to W.N.W., and run in upon it until Fort island bears W. by N. Steer with Fort island on the latter bearing until the lighthouse bears N.N.W., then alter course to N.W. by W. $\frac{1}{2}$ W., taking care, as the rocky ground off the Nag rock is approached, that Loran head is not shut in by Lighthouse point, until the whole of Green island opens westward of Fort island; then, if wishing to proceed to the best anchorage, steer N.N.W. for about a quarter of a mile, then N.E. by E. $\frac{1}{2}$ E. as Scott point opens of Careening point. Having passed Battery shoal, which will be done by keeping the summit of Green island open east of Fort island, steer to the north-east up the cove, and anchor in 5 fathoms, over mud bottom, when Rochford point touches Careening point.

In this anchorage there will be some swell and undertow after heavy gales from the eastward, but the holding ground is good, and the water generally smooth. Vessels sometimes anchor in the western part of the harbour, but the anchorage is neither good nor well sheltered.

With a contrary wind, small vessels, with the Admiralty plan, by attention to the leading marks, and by using the lead, may work in with safety, and find excellent shelter, as before stated, in the north-east cove.

TIDES.—The time of high water, full and change, in Louisburg harbour, is 8h.; springs rise 5 feet, neaps 4 feet, and neaps range $2\frac{1}{4}$ feet. There is but little tidal stream except at the highest tides, when at the entrance the rate of the flood is about half a knot.

GABARUS BAY.—From White point, a low rocky point, 2 miles west from Louisburg, the land trends round to the W.N.W., forming a deep and capacious inlet, named Gabarus bay, which is 5 miles deep, and nearly 5 miles wide at its entrance, between Cape Gabarus and White point. The hardy fishermen, whose scattered houses are principally situated on the southern shores of the bay, are a temperate, industrious, and thriving people.

The centre of this bay is entirely free from danger, but on the north shore, South a quarter of a mile from Simon point, lie some rocks nearly dry at low water; and a shoal with 18 feet on it extends S.W. by W. 3 cables from the same point.

Cormorant and Harbour Rocks.—The Cormorant rocks, of bare slate, South 4 and only 15 feet high, lie off the northern shore of Gabarus bay, cables from Kennington head. They are bold to on their south side; but

east from them, rocky ground extends 2 cables. Near the head of the bay, E.N.E., half a mile from the Harbour rock (a low dry ledge) lies a rock with 18 feet water.

Rouse and Harbour Points.—Rouse point, on the south side of the bay, is a peninsula 50 feet high, with cliffs of slate, and wooded. It is bold to, except on the south-east side, where a reef extends a cable from the shore. Between this peninsula and Harbour point is the only secure boat harbour in the bay.

Harbour point, also a peninsula of drift clay, overlying low slate cliffs, forms the only protection to the anchorage in Gabarus cove, and may be approached to the distance of half a cable.

Gabarus Cove affords during the summer months tolerably safe anchorage in 4 fathoms, sand and clay, to vessels of moderate burthen, but in the heavy gales of autumn, blowing from the east and north-east, there is so much swell and undertow, that vessels have been swept from their moorings and wrecked.

The only other anchorage in Gabarus bay is the roadstead, north of Cape Gabarus, where in 8 or 9 fathoms, sand, and at the distance of 3 cables N.N.E. from the high red bank, a vessel during the prevalence of westerly winds may find good shelter and smooth water.

CAPE GABARUS, low and rocky at its extremity, may be recognized at the distance of some miles in clear weather by some houses and a chapel situated on the rising ground, half a mile inland from the cape. A rocky reef extends East 3 cables from the cape, and the Green rock lies E.S.E. half a mile ; whilst several islets, ledges, and rocks, lie at various distances to the south and south-west. Of these, the most dangerous, because not always visible, are, the Bull rock, only awash at the lowest tides ; and the Guyon ledges, from which a shoal extends, the extreme of which is distant 2 miles S.S.W. from the cape.

A vessel will pass to the southward of all these dangers by keeping the Shag rock—of slate and 22 feet high,—open south of Guyon island, which is low and bare of trees, and in line with the houses on the north side of Fourchè inlet, bearing West.

DIRECTIONS.—Vessels bound from the westward and wishing to anchor either at the anchorage in Gabarus bay north of Cape Gabarus, or in Gabarus cove, should keep the Shag rock well open south of Guyon island, and not haul in for the bay until Rouse point opens north of the cape. Steer in with Rouse point on a N.W. bearing, and after passing the point of the cape haul up W.N.W., and anchor under the high bank in 8 or 9 fathoms, sand. If proceeding to Gabarus cove, having passed Rouse point, haul up N.W. by W., and rounding Harbour point at the distance

of about 30 fathoms, anchor when the stores on the beach in the centre of the cove bear S.E., in 4 fathoms, sand. Good water can be obtained, with some difficulty, from Irish brook, $1\frac{1}{2}$ miles from this anchorage, and small supplies of fresh provisions may be purchased.

TIDES.—At Gabarus cove it is high water, full and change, at 8h. 10m.; springs rise 5 feet, neaps 4 feet, and neaps range 3 feet. The tidal streams in the bay are weak, seldom exceeding half a knot.

FOURCHE BAY and INLET.—Between Cape Gabarus and Fourche head, a distance of 6 miles to the westward, are many rocks and shoals, inside of which is Fourchè bay, affording no shelter, and dangerous of approach. Fourchè head, the west extreme of the bay, is a hummock, bare of trees, and 40 feet high.

On the north side of Fourchè head is Fourchè inlet, on the shores of which are settled a few families engaged in the fisheries. The inlet has a bar at its entrance, nearly dry at low water, and only affords secure shelter to boats.

POT ROCK, with only 9 feet water on it, lies S.S.E. nearly a mile from Fourchè head, and only breaks in heavy weather. The Shag rock, kept in line with the Green rock, and touching Cape Gabarus, bearing N.E. by E. $\frac{3}{4}$ E., will lead to the south-west of this danger, and outside all the shoal water in Fourchè bay.

FRAMBOIS, SEAL, and TILBURY ROCKS.—The Frambois shoal, with 4 fathoms least water on it, lies off the centre of Frambois cove, at 2 miles distant from the shore. This cove, which is the next bight to the westward of Fourchè inlet, affords no shelter, and has a dangerous reef named the Outer breaker lying off its western shore, South three-quarters of a mile from Cape Red.

The Seal rocks, a reef nearly dry at low water, lie 2 cables from the shore, and $1\frac{1}{2}$ miles to the eastward of Capelin cove. A few fishermen have their huts on the east side of this cove, where their boats have the protection of a point of rocks.

The Tilbury rocks (upon which, at low water, are still visible the guns of a ship-of-war, which was lost on it many years since) rise from a shoal of sand and stones, which extends half a mile from the shore at $1\frac{1}{2}$ miles to the westward of Capelin cove.

SANTESPRIT ISLAND, 30 feet high, of clay banks resting on slate, and partly wooded, lies $1\frac{1}{2}$ miles to the westward of the Tilbury rocks. More than a hundred years ago this island was joined to the mainland, from

which it is now distant half a mile, by a beach of shingle; at present a reef of rocks, partly dry at low water, extends from it to the mainland, and leaves no channel. The island may be approached on its south side to a quarter of a mile.

BAD NEIGHBOUR, a rocky shoal with 3 fathoms water on it, lies S.W. by W. $1\frac{1}{2}$ miles from Santésprit island. This shoal only breaks in heavy weather, but a vessel will pass a mile to the southward of it by keeping the low southern Basque islet in line with north side of Michaux point, bearing W.N.W.

L'ARCHEVEQUE COVE, at $3\frac{1}{2}$ miles W.N.W. from Santésprit island, affords shelter at high water to small vessels drawing less than 6 feet; but the bar at its entrance is nearly dry at low water springs.

GRAND RIVER enters the sea about 4 miles east of Michaux point, between Red head (70 feet high) and Bell point, which is a low shingle point, forming the east point of entrance, and from which shoal water and a reef, with only 6 feet on it at low tide, extends three-quarters of a mile to the W.S.W. Although the tide flows up this river 3 miles, the narrowness of the entrance, and the rapidity of the current, make it dangerous of access, even for boats, except at high water. There is some good land up the river, and the shores are settled by a people of Highland descent. A bridge crosses the stream about $2\frac{1}{2}$ miles from the entrance, near which are erected both a church and a schoolhouse.

BLACK BREAKER, with 6 feet water, is a rock lying South one mile from Bell point. The north side of the Basque islets and the north side of Michaux point in line, W. by N., will lead a quarter of a mile northward of the least water on the Bad Neighbour, and the same distance southward of the Black breaker.

Between Santésprit island and Michaux point the shore is rocky and dangerous of approach.

MICHAUX POINT, the eastern limit of Chedabucto bay (page 164), is a wooded peninsula, not more than 40 feet high, joined to the main land by a beach of sand. The three low Basque islets of clay resting on slate, lie East, and are distant one mile from it. There is deep water north of these islets as well as between the islets and Michaux point; and in Michaux cove there is good holding ground and some shelter to vessels during the prevalence of westerly winds, on which account coasters deeply laden occasionally anchor there. A few fishermen frequent this cove during the summer, and their huts are found on the north side of Michaux point and on the Basque islets.

The water is deep to the southward of Michaux point, but around the Basque islets are several dangers. A shoal carrying 3 fathoms water extends S.S.E. half a mile from the south islet; a reef of rocks West $1\frac{1}{2}$ cables; a shoal, having a rock with 9 feet water on it, N.N.W. 3 cables from the same islet; and a rock, dry at half tide, W.N.W. 2 cables from the north islet.

The Basque shoal, lying South three-quarters of a mile from the south Basque islet, has 4 fathoms water on it, and breaks only in heavy weather. Red island just open of Michaux point, bearing N.W. by W., will lead to the southward.

DIRECTIONS.—When standing for the anchorage in Michaux cove, bring the east side of Michaux point to bear North, and then run in for the cove N. by E. Having passed the point at the distance of 2 cables, in 9 fathoms water, round to and anchor when the point bears S.W. in 4 or 5 fathoms, sand and clay.

It would not be safe to remain at this anchorage if the wind veers to the south-east or east, with a falling barometer. In leaving it, if the wind is scant for the south passage, there is a good channel free from danger between the Basque islets and the Shag ledge; after passing the islets, the north sides of Michaux point and the islets kept in line, bearing W. by N., will clear the Black breaker.

TIDES.—At Michaux point it is high water, full and change, at about 8 h.; and the rise in spring tides is 5 feet, in neaps 4 feet, and neaps range 2 feet.

CHAPTER XXIII.

CAPE BRETON ISLAND; LITTLE AND GREAT BRAS D'OR LAKES.

VARIATION 24o West in 1860.

BOULARDRIE ISLAND.—The Great and Little Bras d'or, which are the two channels leading to the Bras d'or Lake, have already been described in pages 193 and 195. Boulardrie island, which forms these channels, is 22 miles long, with an extreme breadth of 5 miles. Sandstone, in some parts containing coal, shale, limestone, and gypsum, are found on its shores, which are thinly settled; the interior being thickly wooded, and rising to the height of 400 feet above the sea.*

ST. ANDREW CHANNEL, on the south-east side of Boulardrie island, is easily navigable, being from $1\frac{1}{4}$ to $2\frac{1}{2}$ miles wide, with a great depth of water, in one place no less than 141 fathoms, but it is only accessible to shipping from within or round the south-west extremity of Boulardrie island, the direct entrance from sea through the Little Bras d'or channel, admitting only small craft and boats.

Five miles within this narrow entrance the channel begins to expand, and there is secure anchorage off the establishment of Messrs. Gammell and Moore; which, with its wharf and a chapel, will be seen on Chapel point. From the settlement here there are roads across to Sydney and its coal mines; some of the latter being so near, that it is probable the coal will be shipped at this anchorage, whenever the often proposed canal at St. Peters shall be constructed, so as to admit vessels by the safer and shorter route through the Bras d'or Lake, instead of the present route round by Scatari island.

Immediately to the south-west of this anchorage, and distant from a half to one mile from Chapel point, there is a dangerous shoal with 4 feet least water, the best channel, a quarter of a mile wide, being between it and the western shore. The chart will point out the reefs to be avoided off Codnor and Grove points, and at Beaver cove; also the secure but confined anchorages within Long island and Island point.

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* *See* Charts:—Gulf of St. Lawrence, Sheet 10, Cape Breton Island, No. 2,727; scale, $m = 0{\cdot}25$ of an inch; and Little Bras D'or Lake, No. 2,687; scale, $m = 0{\cdot}9$ of an inch.

St. Andrew channel is not at present frequented by shipping, which can only reach it through the Great Bas d'or channel, the description of which will now be continued.

GREAT BRAS D'OR CHANNEL.—Having entered the Great Bras d'or channel as directed in page 193, there is nothing in the way of vessels until they approach the Seal islands, distant 5 miles W.S.W. from the entrance at Carey point. These two islands are low and wooded, and separated from the mountainous north-western shore by a narrow and difficult channel, which is almost closed to large ships at its north-east end, by a reef which runs out one-third of a mile from the islands in that direction.

The SEAL REEFS, with 2 feet least water, lie to the south-east of the Seal islands, directly in the fair way of vessels. There is no passage for vessels of large draught between them and the islands, and the ship channel between them and the shore of Boulardrie island is only $1\frac{1}{5}$ cables wide. This narrow passage is rendered still more difficult to strangers by two small rocky shoals on the south-eastern side of the channel; one, with 11 feet water on it, lying a cable's length west from Long beach, and the other, with only 4 feet on it, 2 cables in the same direction from McLean point.

The soundings in this narrow part of the channel are from 6 to 13 fathoms, over rocky bottom; the rate of the tidal streams from 2 to $2\frac{1}{2}$ knots; and the mark which leads through is, Duffus point kept just open of Duncan head, bearing E.N.E.

OTTER HARBOUR.—Otter island is similar to and on the same side of the channel as the Seal islands, from which it is distant $1\frac{1}{2}$ miles. The water is shallow between the west end of the island and Otter point. Otter harbour is to the northward of the island, and affords secure anchorage in from 5 to 9 fathoms, mud; the best berth being off the mouth of the small bay of the main, which forms the head of the harbour, and has a small islet in its centre. The western point of this bay has a reef off it, to the distance of half a cable, which must be avoided by vessels coming to an anchor. Its eastern point, a peninsula separating it from the shallow cove to the eastward, is named Harbour point, $1\frac{1}{4}$ cables from which, and N.E. a quarter of a mile from Otter island, lies the westernmost of several small islets. Between this islet and a reef running out $1\frac{3}{4}$ cables E. by N. from Otter island, is the entrance of the harbour, $1\frac{1}{4}$ cables wide, and carrying 5 to 8 fathoms water.

DIRECTIONS.—When approaching the anchorage in Otter harbour from the eastward, the reef off the islets will be cleared by keeping some

part of the Seal islands to the southward of Seal point, until Harbour point appears to the westward of the westernmost islet, bearing W.N.W., then haul in, so as to pass the islet at a distance between 60 and 200 yards, and when Otter point is seen to the northward of Otter island, the vessel will be within the reef and may choose her berth at pleasure.

In approaching from the westward, pass Otter island at the distance of half a cable or more, steering for the Seal islands; and to clear the reef off the east end of Otter island, do not haul into the harbour until the westernmost islet bears N.N.W.

PORT BEVIS, 6 miles to the south-west from Otter harbour, and on the same side of the channel, is a large cove running in $1\frac{1}{2}$ miles to the north-west, and curving round the south-western termination of the range of mountains, which has continued unbroken all the way from Cape Dauphin, a distance of 15 miles, attaining in some parts an elevation of 1,000 feet above the sea. The anchorage in the port is quite secure, in from 7 to 4 fathoms, mud; the latter depth being half a mile in from the entrance, where the cove is divided into two shallow arms.

The entrance to this port being $3\frac{1}{2}$ cables wide, and free from danger, the only direction necessary is to anchor about two-thirds over towards the north-eastern shore; the soundings being rocky, and comparatively shoal, 3 to 4 fathoms, one cable's length out from the opposite shore.

Gypsum abounds in the cliff on the south-west side of Port Bevis, and also along the shore to Red head at the entrance of St. Patrick channel, a distance of 5 miles.

COFFIN ISLAND, a small narrow bank of red clay fast wasting by the waves, lies on the opposite or southern shore, half a mile to the northward of Kemp head, the south-west extreme of Boulardrie island. A reef extends off either end of Coffin island, in a W.S.W. and E.N.E. direction, to the distance of a quarter of a mile; and there is a channel for small craft, but not for ships, between it and the shore. A vessel will pass to the northward of the reef if McFarlane point be not shut in behind Frazer point; for those points in one lead past the reef at the distance of three-quarters of a cable.

ROCKY PATCHES.—In the channel, and a short distance to the eastward of Coffin island there are two small rocky patches, on which no less than $4\frac{1}{2}$ fathoms could be found, but which nevertheless had better be avoided in a large ship. One of them lies N.N.W. $\frac{1}{2}$ W. 4 cables from

Coffin point, and the other S. $\frac{1}{2}$ E. $4\frac{1}{4}$ cables from McRae point, on the north-western shore.

In the 17 miles of the Great Bras d'or channel just described from Carey point to Kemp head, the only good anchorages are those which have been noticed. In the channel the long reaches allowing of considerable swell, and in many parts the great depth of water, amounting off Otter island to 58 fathoms, render the anchorage insecure.

ST. PATRICK CHANNEL,* the entrance of which, between Red and McKay points, is $1\frac{3}{4}$ miles wide, extends from Red point to Whycocomagh, a distance of 21 miles in a westerly direction, with an average breadth of one mile. It is navigable throughout for vessels of large draught, but not much frequented nor much known. Its banks, moderately high, rise into hills of considerable elevation at a short distance from the shore, and the land is generally susceptible of profitable culture. The settlers, however, are few, and their state of isolation and poverty is in sad contrast with the fine country they inhabit.

This channel during rough and blowing weather is subject to heavy squalls of wind, making its navigation often dangerous to open boats under sail.

There are excellent anchorages in Baddeck, Cow, and Indian bays on the north side of the channel, and Washaback river on the south side; indeed the whole affords fair anchorage and good holding ground. But for these anchorages as well as to navigate safely St. Patrick channel a pilot should be employed, and on this account the directions will be brief.

BADDECK BAY is $2\frac{1}{2}$ miles deep in a N.E. by E. direction and free from danger to its head, where it receives the waters of a small river. The best anchorage is after passing the long shingle beaches.

BADDECK HARBOUR, formed by Kidston island on the western shore of Baddeck bay, affords snug anchorage for small craft. The village of Baddeck derives some little importance from being the county town; it contains, however, at present (in 1858) less than 200 inhabitants. There are some signs of growth and enterprise amongst its inhabitants, for one or two vessels of large burthen are built here annually and several schooners sent with agricultural produce to Newfoundland, whilst a small steamer plies between Baddeck and Sydney twice a week during the summer months. Fresh meat can be purchased at the village, and good water obtained from a brook one mile west of the harbour.

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* The description and directions for this channel are by Commander J. Orlebar, R.N., who surveyed both it and the River Denny in the year 1857.

DIRECTIONS.—There are two entrances into Baddeck harbour, but the eastern entrance is to be preferred, and for which the following brief directions will suffice.

With a fair wind, having passed Red point which is bold to, steer N. by W. for the church, which situated close to the shore forms a prominent object about half a mile east of the village. Continue on this course until the western passage opens, then steer W. by S., and passing the low beach point of Kidston island, anchor in $4\frac{1}{2}$ fathoms, mud.

With a beating wind, haul close round Red point and work up on that shore as it is free from shoals, tacking by the lead.

On the southern shore of the entrance of St. Patrick channel there are shoals extending nearly half a mile, from Double and Bone islands. A vessel will pass to the northward of them by not opening out the land east of Red point.

COW BAY, 5 miles west of Baddeck harbour, has a sandy shoal with 18 feet water stretching from its west point; but this can easily be avoided, and by passing round its east end good anchorage obtained in 7 fathoms, mud.

INDIAN BAY, one mile farther west, receives the waters of two rapid but shallow streams called Middle and Baddeck rivers; the latter flows through a rich alluvial valley for some miles. This bay is gradually filling up and is very shoal near the mouth of the rivers, but there is good sheltered anchorage in other parts.

WASHABACK RIVER, on the south side of St. Patrick channel, is more properly a creek, as it only receive a small run of indifferent water about 3 miles from its entrance. Vessels of large draught may find snug anchorage some little distance up this creek, but the entrance is narrow, and the deep water channel runs close to Plaster point, the east point of entrance. Oysters of a good quality abound up the creek.

DIRECTIONS.—St. Patrick channel, to the eastward of Maciver point, being wide and free from danger may be navigated without difficulty, with the Admiralty chart, and taking care to avoid Stony islet lying nearly awash on the north side of the channel, and the shoals off Bone island and Crow point on the south side, the use of the lead giving sufficient warning in approaching either shore; but to the westward of Maciver point, a shoal extending a quarter of a mile E.S.E. from a small stony islet called Bell rock, and on the other side the Maciver bank, of mud, with 4 feet least water, extending W.S.W. one mile from Maciver point, narrows the channel to a quarter of a mile.

To pass between these shoals, bring Cranberry point to touch Cow

point, bearing E.NE. and steer with this mark on astern, until Bell rock comes in line with Hume islet, when alter course to S.W., keeping this latter mark astern, until the Narrows church is seen touching the bank of Curlew point, W. by S. $\frac{1}{2}$ S. This latter mark will lead in mid channel between Eel shoal and the rock off Green point; on approaching Curlew point alter course to West, when having cleared its low marshy point, steer S.W. by W. for the sandy spit on the south side of the entrance.

Having passed this spit, which is bold to, steer with the Narrows church and sandy spit astern, bearing N.E. $\frac{1}{2}$ N. to clear the shoal extending one cable to the southward from Narrows point, which having passed, the vessel will enter a lake $1\frac{1}{2}$ miles wide, 6 miles long, and free from danger.

A West course will lead up the middle of this lake to the anchorage off Whycocomagh settlement, only taking care to avoid a shoal extending N.N.E. half a mile from the west point of Maciver island. The water is shoal towards the head of the lake, but the bottom is mud, and the anchorage safe. There are sheltered anchorages, with deeper water, on the south-west side of Indian island and the south side of Maciver island, but as these are not frequented, it is not necessary to describe them.

There are no tidal currents, nor any perceptible rise of tide, but the waters of the lake are affected by the prevalent winds, being highest during north-east winds, and lowest during south-west winds; the difference of level is seldom more than one foot.

The LITTLE BRAS D'OR LAKE, in which the channels on either side of Boulardrie island unite, is 9 miles long from Kemp head to Barra strait, and from 3 to 5 miles wide. The depth of water in it is very irregular, exceeding 60 fathoms in some parts, whilst in others there are dangerous shoals. There are settlements thinly scattered along the shores of the lake.

DOUBLE ISLAND and BURNT SHOAL.—Double island, lying at the entrance of St. Patrick channel, between Red and McKay points, should not be approached on its eastern side nearer than a quarter of a mile, or the depth of 5 fathoms. Half a mile S.W. from McKay point is Burnt point, from which a reef runs out $1\frac{3}{4}$ cables; and at three-quarters of a mile E. by N. from Burnt point lies Burnt shoal, with 21 feet least water on it.

BOULACEET HARBOUR, at $2\frac{1}{2}$ miles to the S.S.W. of Burnt point, is $3\frac{1}{2}$ cables wide at the entrance between Parliament and Gillis points. The latter is the western point of entrance, and the only danger to be avoided is the reef which runs out a cable's length from it to the eastward. On the north shore of the harbour, 3 cables within the entrance, a long shingle spit will be seen, which is quite bold-to, and the deep

water, 5 to 4 fathoms over mud bottom, continues 2 cables farther in; the whole distance from the entrance to the head of the harbour being three-quarters of a mile, and the least breadth, at the shingle spit, one cable.

Proceeding westward from Boulaceet harbour, the shore is bold for the first 2 miles; it then becomes dangerous to strangers for the remaining 2 miles to Barra strait: shoals extending 4 cables off Lieutenant pond, and 2 cables off McPherson point.

McPHEE and BIG SHOALS.—Off the south-eastern shore of the Little Bras d'or Lake, the easternmost danger is McPhee shoal, with 18 feet least water, and three-quarters of a mile off shore. It bears from Black point N.E. $\frac{1}{2}$ N., one mile; and, with much rocky and irregular soundings to the northward of it, lies in the entrance of St. Andrew channel (page 213).

Big shoal, $2\frac{1}{2}$ miles farther to the westward, is an extensive rocky bank with very irregular soundings. Besides several patches of 3 fathoms, there is one near the northern edge which dries at low water, and bears from Long Beach point N.W. $1\frac{1}{3}$ miles.

CHRISTMAS ISLAND lies close to the south-eastern shore of the Little Bras d'or Lake, and $1\frac{3}{4}$ miles from Barra strait. The shoal water extends only $1\frac{1}{2}$ cables off this island to the northward, and there is an excellent harbour within it for boats and small craft, the narrow entrance, carrying 6 feet water, being from the westward. There is good anchorage, excepting in strong north-east winds, half a mile to the westward of the island, in the bay between it and Neilban cove, and in 9 fathoms, mud; observing that the shoal water extends 2 cables from the island in that direction. A chapel, a large white wooden building, will be seen on the mainland, near the island.

BARRA STRAIT, commonly called the Strait of Barra, and by the country people the Big Narrows, is $1\frac{1}{4}$ miles long, and half a mile wide, excepting at its north-eastern entrance, where the breadth is reduced $2\frac{3}{4}$ cables by the sand and shingle beaches of Uniacke and Kelly points, which are respectively the north-western and south-eastern points of entrance. These beaches are bold at their extreme points, but shallow on their north-eastern sides to the distance of a quarter of a mile from the shore. There are settlements on the shores of the strait.

KELLY and BARRA SHOALS.—The Kelly shoal, off Kelly pond, is most in the way of vessels entering Barra strait. It extends a quarter of a mile N.E. $\frac{1}{2}$ N. from Kelly point, and 2 cables from the beach of Kelly pond; and its northern extremity, on which there are 14 feet

water, will be cleared by keeping Derby point open to the northward of Kelly point.

Barra shoal, of rock, and three-quarters of a mile in length, lies across the north-eastern entrance of the strait; and, together with the shoal off Kelly point, renders the passage indirect and difficult at times for a vessel of large draught. The least water, 11 feet, bearing from Uniacke point N.E. by E. $6\frac{1}{2}$ cables, is just cleared to the southward by the line of Derby point and Kelly point in one, bearing S.W. $\frac{3}{4}$ S., or by the summit of Hector hill in line with Uniacke point, W. by S. $\frac{3}{4}$ S.; but those marks only clear the least water, not the whole of the shoal, which they lead over in 3 fathoms water. Kelly and Hector points, touching and bearing W.S.W., lead into the entrance of the ship channel, which is to the southward of the shoal, between it and the shoal off Kelly point, and which carries from 6 to 15 fathoms water, over rocky bottom. Within the strait the depth is much greater, amounting in one place to 33 fathoms, and the shores are bold on either side.

TIDES.—The rise of the tide in Barra strait is nearly insensible, amounting only to a few inches; it is difficult to distinguish it from changes of level caused by the winds. The rate of the streams is also very irregular, and seldom exceeds one knot, excepting when increased by winds, present or at a distance.

DIRECTIONS through LITTLE BRAS D'OR LAKE.—With the assistance of the chart, and the description of the dangers already given, little difficulty will be experienced in passing through the Great Bras d'or channel, and into the Little Bras d'or Lake, the northern shore of which should be preferred, in order to avoid the dangerous Big shoal (page 219), until the vessel has advanced as far as Boulaceet harbour: from thence, steer over towards the western end of Christmas island, until Kelly and Hector points are touching, when alter course to W.S.W., or so as to keep those points touching, until the west side of Neilban cove bears South; then steer W. $\frac{3}{4}$ S. for Uniacke point, until the leading marks for clearing the shoal off Kelly pond, namely, Derby point open to the northward of Kelly point, come on; then a course may be shaped so as to pass through the strait into the Great Bras d'or Lake.

The GREAT BRAS D'OR LAKE is 12 miles wide, from Barra strait to the entrance of St. Peter inlet, and 37 miles long, measuring from the head of the West bay to that of the East bay. The depth of water in this marine lake is extremely irregular; in some parts amounting to 50 fathoms, in others abounding with shoals, covered by only a foot water.

McKINNON SHOAL, which must be avoided in crossing this Lake from Barra strait to St. Peter inlet, is an extensive rocky bank, with

18 feet least water, stretching out S.E. by S., $1\frac{1}{2}$ miles from McKinnon point. A vessel will pass 2 cables to the eastward of it by keeping Hector and Kelly points touching, and bearing E.N.E.

This and several other shoals are in the bay, between Hector and Malagawatcht points; the latter point bearing from the former, S.W. by W. $\frac{3}{4}$ W., $6\frac{1}{2}$ miles. In the head of the bay there are several islands, to the northward of which is McKinnon harbour, having 11 feet water in its narrow entrance; and also the entrance of the river Denny.

The RIVER DENNY* is a small stream, having its sources in the eastern slope of the hills east of Judique, and its general course is E.S.E. It enters the Great Bras d'or Lake through two deep water inlets, called North and South basins, the real mouth of the river being at the west extremity of the South basin. Eight feet water can be carried up the river for 2 miles, and boats may ascend, with some difficulty, on account of sunken drift wood, about 5 miles farther to the bridge; but above this the stream becomes rapid and shallow.

The main entrance of this river from the Lake lies between the low wooded Entry island and Mackeane point, and is one mile wide. It may easily be recognized as the first opening in the low land after passing the hilly country forming the west side of Barra strait. If the channel be kept, more than 4 fathoms water can be carried for a distance of 6 miles into the South basin, and an excellent anchorage obtained off the settlement at Plaster cove.

A few years ago this river was the resort of some vessels engaged in the timber trade, but the available timber being exhausted, this traffic has now ceased, and it is only visited by small schooners trading for produce. The settlers are of Highland descent, and support themselves entirely by farming. They have day and Sunday schools, and are generally a moral and religious people, and, although much isolated and far from old country associations, they cherish all the best qualities of the Highland character.

Excepting the range of hills between this river and West bay, the land is generally low and wooded, and the absence of any remarkable features makes it quite necessary for its safe navigation that there should be a local knowledge of the points and objects named.

DIRECTIONS.—A vessel bound for the river Denny from Barra strait, from which the entrance is distant 5 miles, and having passed McKinnon shoal, should steer N.N.W. immediately Entry island, bearing N.W., touches Mackeane point, as this mark clears the west side of McKinnon

* The description and directions for this river are by Commander J. Orlebar, R.N., 1857.

shoal. Proceed on this course until Mackeane point bears East, then steer W.N.W., passing in mid-channel between Round island and Mackeane point, and when abreast of Round point, alter course to West, bringing Mackeane point to touch Round point, astern, E. ¾ S. Crossing the mouth of Portage creek on this mark, look out for Martin point, touching Macdonald point; upon this latter mark coming on, alter course to S.W. by W., steering for a house on Boom island; this will lead in mid-channel, between Little island and Bush point; and on opening the Boom passage, alter course to W.N.W.

Proceed nearly on this latter course through the passage, keeping in mid-channel, and on rounding Kelly point, steer W. by N., bringing Kelly and Bush points in line, astern, to clear the Boom shoal, a ledge of rocks, nearly dry at low water, lying W.N.W. from Boom point. By proceeding thus the vessel will enter the North basin, an inlet extending W.N.W. 2 miles, and half a mile wide, and will find in every part of it good anchorage. But if wishing to proceed farther, continue on the mark above mentioned, until all the Malagawatcht hills are shut in by Stony point, bearing S.S.E. Steer upon this course, towards Stony point, until Canal point is seen open of Bank point, when a S.E. course will lead in mid-channel between Bank and Stony points, until Plaster and Maclean islands are seen touching, and bearing W. by S. ½ S. The vessel will now be clear of the Stony point shoal, and fairly within the South basin, and a south-west course will lead to Plaster cove, off which good anchorage will be found at a quarter of a mile off shore in 18 feet water, muddy bottom.

The South basin expands east and west 5 miles, and is three-quarters of a mile wide, having good anchorage throughout. Its few settlers are principally congregated at Plaster cove, where supplies may be purchased and wood and water easily obtained.

There is some little current in or out the narrow parts of the channels leading into river Denny, but it seldom exceeds half a knot per hour, and its direction depends upon the wind; rising waters and incoming current with a northerly wind, and falling waters and outgoing current with a south-west and southerly wind.

COD and KELLY SHOALS.—The Cod shoals, extensive rocky fishing banks, with 21 feet least water, and lying 1½ to 3 miles to the S.S.W. from the southern entrance of Barra strait, are only dangerous to vessels of large draught. Hector and Uniacke points in one, and bearing N.E. ½ E., lead half a mile to the westward of them, and through the channel, 2 miles wide, between them and McKinnon shoal.

Having passed the Cod shoals, there is nothing in the way in crossing the wide central part of the Great Bras d'or Lake until a vessel arrives near

the extremely dangerous Kelly shoals, which are of rock, with 4 feet least water, and lie off the entrance of St. Peter inlet, covering a space $1\frac{1}{2}$ miles in diameter, nearly midway between the Red islands and McCrea point on the western shore, from which they are distant $1\frac{1}{2}$ miles.

The approach to these shoals is indicated by the opening out of the marks for leading to the northward of them, namely, the south extremity of the Red islands bearing East, and in one with Mill cape, a rocky and precipitous point, distant 2 miles from the islands. There is deep water all around these shoals, but the passage to the westward, between them and McCrea point, is the most direct ; and the marks for clearing them on that side are, Trap point and Indian point in one, bearing S. $\frac{1}{4}$ W., the former being the extreme western point of Chapel island, in St. Peter inlet, and which will be recognized by the large cross on its summit. These marks lead over the west end of the Kelly shoals in 5 fathoms water, and also close to the eastward of the 3-fathoms shoal off Cape George, which having passed, the vessel will enter St. Peter inlet.

ST. PETER INLET.—On the eastern side of the entrance to this inlet are Macnab creek and Soldier cove, which have depth of water sufficient for vessels of large draught, but can only be approached by passing between dangerous shoals ; but by keeping over towards Cape George, and steering so as to pass to the westward of Chapel island, there is nothing in the way until the vessel arrives off its west point, where the ship channel between it and Dock point, a shingle beach of the mainland inclosing a small pond, is half a mile wide.

Off the western side of Chapel island there is good anchorage in 11 fathoms water, mud, with the large cross bearing N.E. by N., the chapel, near the south end of the island, S.E. $\frac{1}{2}$ S., and at a distance of between 1 and 2 cables off shore. This anchorage is between Chapel and Doctor islands, the latter lying half a mile to the westward of the former and diagonally across the inlet, leaving passages on either side about a quarter of a mile wide.

Of these passages the easternmost, between the island and Indian point, is so intricate as to be only fit for small vessels ; but the ship channel, which curves round the island and between it and the mainland to the westward, is clear from detached dangers, and carries from 8 to 10 fathoms water. It is, however, reduced to the breadth of a cable by shoals on either side, and as it is still narrower and more crooked in several other parts of the inlet, any farther written description or directions would be of little use in the absence of buoys and beacons. Referring, therefore, to the Admiralty chart, the aid of which or a properly qualified pilot would be indispensable to a stranger, it will merely be added

that the channel is everywhere deep enough for the largest vessels that could enter the Bras d'or, until they arrive within the distance of 2 cables from the wharf at the Haulover, at St. Peter. To reach the wharf they would have to pass over 15 feet, which is the depth of water between it and Campbell island.

From the entrance of St. Peter inlet (between Evan point and Cape George) to the Haulover, the site of the proposed canal (page 163), the distance is $7\frac{1}{2}$ miles, and the navigation could be rendered easy for a steamer or sailing vessel with a fair wind, by a few buoys judiciously placed. The scenery in the inlet is very beautiful; the shores as yet are thinly settled, but the country is everywhere more or less susceptible of cultivation, being based upon silurian rocks, greywacke, slate, and carboniferous limestone, covered by a tolerably productive soil.

BARACHOIS, JOHNSON, and CAMPBELL HARBOURS.—In the first 3 or 4 miles north-eastward from St. Peter inlet, an example of the extraordinary distribution of land and sea, so remarkable elsewhere in the Bras d'or, is afforded by the peninsulas and islands, connected together by shingle beaches, which form the intricate Barachois and Johnson harbours, within Evans and Wilson islands. For these, together with Campbell harbour and other coves and ponds, capable of affording shelter to small vessels and boats, and also for the dangers in the passage between those places and the Kelly shoals, and Red islands, the mariner is referred to the Admiralty chart.

RED ISLANDS, distant 4 miles N.N.E. from St. Peter inlet, and so called from their cliffs of red sandstone and clay, are four in number, two of them very small, and they are so arranged as to form a secure boat harbour, open to the southward towards the mainland, in which direction they are prolonged under water, so as to leave a navigable passage only a quarter of a mile wide. The outer or northern point of these islands is distant $1\frac{1}{2}$ miles from the shore at Campbell harbour, and has a small rocky 4-fathoms patch off it, one mile to the N.E. by E. Within the distance of half a mile from this patch the depth amounts to 30 fathoms, and one mile to the eastward to 50 fathoms. At the Red island settlement, on the mainland opposite to the islands, there is a chapel, and the land rises in the rear to the height of 450 feet.

LOCHMORE HARBOUR.—Proceeding eastward, the East bay is clear of danger until past Lochmore, a harbour for small craft, on the southern shore, distant 10 miles from the Red islands, formed by a long shingle beach, having its entrance from the eastward, and 8 feet water on its bar. There is a chapel here, and the country is well settled between the sea

and the hills, which rise to the height of 500 feet, half a mile back from the shore.

CHRISTMAS POND.—Directly opposite, on the northern shore of East bay, and distant $2\frac{1}{2}$ miles, Christmas island will be seen, and half a mile to the westward of it, the sand and shingle beach of Christmas pond, forming another boat harbour, rendered difficult of access to strangers by the shoals off either end of the island. On the mainland, nearly opposite the island, and on the banks of a considerable stream, are the Indian chapel and settlement of Eskiscogumic.

MACPHEE ISLAND.—The dangers in East bay commence 2 miles farther to the eastward, at Macphee island, which is composed of three parts connected together by shingle beaches. The easternmost part of the island is joined to the mainland by a beach of sand and shingle, one mile in length in a north-west direction; and to the westward of this beach, and on the northern side of the island, there is a small but secure harbour for small vessels and boats. The reefs off the southern side of this island, and also off its east and west points, are exceedingly dangerous, being covered by only 2 or 3 feet of water, and extending half a mile from the shore.

Similar shoals continue for 2 miles to the eastward, and reach half way across towards the southern shore of the bay, which is here $1\frac{1}{4}$ miles wide. Intricate channels between these shoals lead into a harbour, to the northward of Macphee island and its long shingle beach, containing five islands, and extending westward to the Indian settlement, a distance of $2\frac{1}{4}$ miles. The depth of water in this harbour is sufficient for vessels of large draught, but the best entrance even, between the reef off Macphee island and the shoals to the eastward of it, is too difficult, in the absence of buoys and beacons, for any written directions to avail.

MARBLE and MACDOUGAL POINTS.—Directly opposite Macphee island, on the southern shore of East bay, and half a mile eastward of Marble point, a shingle beach incloses a large pond, and has a long reef running out from it to the eastward, and at the distance of a quarter of a mile from the shore. Marble hill, in rear of the point, rises to the height of 540 feet above the sea. On the eastern side of Macdougal point, $1\frac{1}{2}$ miles farther to the east, there is a similar pond. The shoal water runs out 2 cables from this point towards the shoals which have been mentioned off the opposite shore, the channel between them being $6\frac{1}{2}$ cables wide.

COSSET and McADAM POINTS.—At Cosset point, on the northern shore of East bay, and 3 miles eastward from Macphee island, there is

another small harbour open to the eastward, and formed as usual by a sand and shingle beach, from which a dangerous reef runs out 4 cables' lengths to the south-east.

McAdam point, one mile farther to the eastward, has also a reef off it to the distance of $1\frac{3}{4}$ cables' lengths; and one equally long runs out from a point a little farther up the bay on the southern shore. The remaining distance of $3\frac{1}{2}$ miles to the head of East bay, is free from danger, the shallow water nowhere reaching beyond three-quarters of a cable from the shore.

HEAD of EAST BAY.—At the head of East bay shingle beaches inclose a large pond, which boats can enter, and ascend to the bridge, a distance of three-quarters of a mile. The pond continues one mile farther, shallow and full of mud and weeds; and from its head the distance is 2 miles to Forks lake, and 4 miles to the south arm of Sydney harbour, into which the lake just named discharges its waters.

The main post road from Halifax, which crosses the Gut of Canso at Plaster cove, and passes by St. Peter, continues along the southern shore of East bay, and from its head across to Sydney harbour. There is a chapel on this road near the head of the bay, and there are thinly scattered houses along the whole route.

The soundings in East bay, as in all other parts of the Bras d'or, are very irregular; the greatest depth, 42 fathoms, occurs above Macdougal point, where the breadth is only $1\frac{1}{4}$ miles. The long fetch, the great depth of water, or the nature of the bottom, render the anchorage everywhere unsafe, excepting in the small and confined places which have been named.

MALAGAWATCHT HARBOUR, situated between Malagawatcht (page 221) and Militia points, on the western side of the entrance of West bay, runs in $3\frac{1}{4}$ miles to the N.W. by N., and is separated at its head from the river Denny, by a low neck of land only 120 yards broad. The entrance of this fine harbour, between Gillis and Pellier points, the latter on the south side, is three-quarters of a mile wide, but Sheep island, separated by a narrow channel from Pellier point, reduces the breadth to 4 cables. At the distance of one mile in from the entrance, at the first Narrows, the channel contracts to 320 yards, and the deep water to half that width; it then expands into a fine basin, affording secure anchorage to any number of the largest ships. From the north side of this basin the second Narrows, 270 yards wide, and carrying 4 fathoms water, communicates with the inner harbour, which has deep water quite to its head.

Gillis Shoal, which has 11 feet least water, and lies from $3\frac{1}{2}$ to 6 cables S.E. of Gillis point, is the principal danger to be avoided in entering Malagawatcht harbour. There is deep water all around the

shoal, but the widest and most direct channel into the harbour is to the southward of it, where the breadth of the deep water, between it and the reefs off Pellier point and Sheep island, is 3 cables.

Pellier Point Reef.—The reef off Pellier point is also dangerous, having only 8 feet water on it, and extending $3\frac{1}{2}$ cables to the E. by S. The marks which just lead to the southward of it, are Militia point and the south extremity of George island in one, bearing W. $\frac{1}{2}$ S.; and it will be cleared to the north-east if the south side of the first Narrows be not shut in behind Sheep island: this last named mark leads over the northern side of the reefs off Sheep island.

There is also a small rocky patch, lying S.E. by E., two-thirds of a mile from Pellier point on which no less than 28 feet water could be found. From it the southern sides of Militia and Green islands are in one; and Sheep island and the southern side of the first Narrows are touching.

DIRECTIONS.—To run into Malagawatcht harbour with a leading wind, bring Militia point and the south extremity of George island in one, bearing W. $\frac{1}{2}$ S., and run towards them, and they will lead 3 cables outside the Gillis shoal. Continue the W. $\frac{1}{2}$ S. course, until the northern side of Sheep island comes on with the eastern point of Johnson cove, bearing W.N.W.; then alter course to W.N.W. or so as to keep those marks on, until Militia and Pellier points are in one, bearing W. by S. $\frac{3}{4}$ S.; then steer N.W. by N. until Militia island and Pellier point are touching, and bearing S.W.; and then N.W. $\frac{1}{2}$ W., or so as to keep in mid-channel, until the vessel arrives at the first Narrows, when the course must be changed 2 points to the northward, or so as to avoid the shoal just within the Narrows, which extends $1\frac{1}{4}$ cables from the southern shore, causing the channel to curve to the northward. Having passed the Narrows, which will require great care, the deep water being there only 160 yards wide, the vessel may be anchored over towards the northern side of the basin, in 6 or 7 fathoms, mud, and sheltered from all winds.

PELLIER HARBOUR, into which, with a fair wind, the depth of 21 feet can be carried without difficulty, is formed by the peninsula of Pellier point, which has several buildings at its south-west extremity, and a long shingle beach which shelters the harbour, and forms the eastern side of the entrance. Militia island, lying half a mile to the southward of the harbour, and a third of a mile E.S.E. from Militia point, has a dangerous reef running out $1\frac{1}{4}$ cables to the N.N.W., and shallow water to a less extent all around it.

DIRECTIONS.—Approaching Pellier harbour from the eastward, and by the preferable channel to the northward of Militia island, where the

deep water is $1\frac{1}{4}$ cables wide, attend to the marks already given for clearing the reef off Pellier point. Bring Militia point to bear West, and run towards it until Pellier point and Sheep island are touching; then steer for the harbour's mouth; observing that George island must be shut in behind Militia point to clear the reef off Militia island. In entering the harbour, haul round the shingle beach at any distance between three-quarters and $1\frac{1}{4}$ cables, and anchor within it in 4 or $4\frac{1}{2}$ fathoms, mud.

In approaching the harbour from the southward, the leading marks for running through between Militia island and Militia point, where the deep water is $1\frac{1}{2}$ cables wide, are the western extremity of the peninsula of Pellier point, where it is united to the mainland by the beach of Johnson cove, open to the westward of the point of shingle beach at the entrance of the harbour, when the extremity of the last named shingle beach should bear N.N.E. $\frac{1}{2}$ E. The same marks lead to the eastward of the shoal (17 feet) which lies $2\frac{3}{4}$ cables' lengths to the southward of Militia point. The reef off the north point of Militia island can generally be seen, but when invisible it is extremely dangerous, having $9\frac{1}{2}$ fathoms close to; and to clear it, great care must then be taken not to bring the western extremity of the shingle beach at the entrance of the harbour to bear to the northward of N.N.E.

WEST BAY is $3\frac{1}{2}$ miles wide at entrance, between Militia point and Poor islet, on the southern shore, and increases within to the breadth of 5 miles; whilst its length from the entrance to the head is 11 miles. Over this great expanse the soundings are irregular to an extraordinary degree, numerous rocky shoals, covered by only a few feet of water, having a depth of 20 fathoms or more near and between them.

In this bay cliffs of red sand and clay, and of sandstone alternating with shingle beaches, inclosing ponds or uniting peninsulas to the mainland, form the predominating features of the southern shore; in rear of which, and at distances varying from a half to one mile, rises a range of wooded hills to the height of 600 feet. On the slopes of these hills, or between them and the shore, there are fine settlements, and two Kirks or Scotch churches; the one near the east point of Pringle cove, and the other at Black river. These are both wooden buildings, and the last, which has a steeple, and is situated 2 cables' lengths back from Ballam wharf and store, is hidden by intervening land from almost every direction, excepting the north.

On the northern shore a parallel range of wooded hills runs westward from Little harbour, separating West bay from the river Denny, and attaining the elevation of 750 feet. These hills are more steep than

those on the opposite side of the bay, leaving a smaller space for settlements, which are not extensive, excepting at Little and Malagawatcht harbours.

LITTLE HARBOUR, which is distant $1\frac{1}{4}$ miles to the north-west from Militia point (page 227), has a narrow but unobstructed entrance, 80 yards wide, and with 3 fathoms water, and which leads into a land-locked basin three-quarters of a mile across, and carrying $3\frac{1}{2}$ to $4\frac{1}{2}$ fathoms water, over a bottom of mud. The whole distance from the entrance to the head of this beautiful harbour, where it is separated from Malagawatcht by an isthmus about $1\frac{1}{4}$ cables across, is one mile to the north-east. Off its entrance at half a mile to the S.S.W. lies a rocky bank, with 19 feet least water on it; and at the distance of $1\frac{1}{2}$ miles to the S.W. $\frac{1}{2}$ W. is George island, properly a peninsula, since it is united to the mainland by a shingle beach.

Between George island and McLeod point on the southern shore, a distance of $3\frac{1}{4}$ miles, are numerous rocky shoals, so scattered about that a chart on a large scale, resulting from this survey, and to which the following remarks refer, would be indispensable to the safety of a large ship among them.

PADDLE SHOAL, the easternmost of these dangers, lies S.E. by S., one mile from George island, and extends a third of a mile farther in the same direction, the least water on it being 13 feet. Malagawacht point kept in one with Pellier point bearing N.E. $\frac{1}{2}$ E., or midway between it and Militia island, will lead to the south-east of the shoal, and between it and the Outer shoal, which, with 22 feet least water, lies half a mile from it to the S.S.W. The marks for the south-eastern edge of the last named shoal, are Malagawatcht point just open to the eastward of Militia island bearing N.E.

GEORGE, NAMELESS, and MIDDLE SHOALS.—George shoal, which is separated by a narrow channel from the south extremity of George island, and extends from it 4 cables' lengths to the southward, has 9 feet least water on it; and the Nameless shoal, with 14 feet water, is distant from 6 to $8\frac{1}{2}$ cables S. by W. from the same point.

The Middle shoal, with 17 feet water on it, lies 6 cables farther to the southward; the eastern end of George island bearing from it N.N.E. $1\frac{1}{2}$ miles, and Green island N.W. $\frac{3}{4}$ W. one mile. The line of Clarke and Green islands touching, and bearing N.W. $\frac{1}{4}$ N. will lead clear to the southward of it.

Between the Middle shoal and the reef extending a quarter of a mile from McLeod point, on the southern shore, lie the McLeod shoals, on which the least water is 23 feet. Poor islet and the southern extreme of the

peninsula of Morrison head touching, and bearing S.E. ½ E. will lead clear to the north-east of them.

PRINGLE SHOAL, which lies half a mile farther to the westward, is much more dangerous, having only 12 feet least water. It is distant a third of a mile from Pringle island, and extends half a mile farther off in the same direction. Morrison head and Poor point in one, bearing S.E. ¾ E. lead over the northern part of this shoal in 4 fathoms; also over the southern point of the McLeod shoals in 4¾ fathoms, and, lastly, over the northern edge of the shoal water off McLeod point, from which a reef extends a quarter of a mile to the northward.

Nearly midway between the reef off McLeod point and Pringle island there is a shoal with 14 feet water on it, lying 4 cables' lengths off shore. There is a secure harbour for small craft within Pringle island, and for boats within the peninsula of McLeod point.

POOR ISLET, lying one mile farther to the eastward, is very small, and united to the shingle beach of Poor point by a reef; the shoal water extends a quarter of a mile from it to the northward, and a rocky bank, with 18 feet water, and separated from it by a very narrow channel, half a mile to the eastward. The leading marks for clearing these dangers are, either Pringle island just open to the northward of McLeod point, bearing W. by S., or Morrison head and McCrea point in one, bearing S.E. ½ S.

MORRISON HEAD and McCREA POINT.—Morrison head, distant 1⅓ miles eastward from Poor islet, will easily be recognized, being a small peninsula, 60 feet high, with red cliffs, and united to the southern shore by a shingle beach. It has a small boat harbour on its eastern side, and shallow water off it to the distance of a quarter of a mile. There is also a rocky bank, with 4½ fathoms water, lying two-thirds of a mile from it to the E.N.E.

McCrea point is distant 2¼ miles to the south-east of Morrison head, and midway between them lies a rocky bank, with 21 feet water, the northern end of which is distant three-quarters of a mile north from Scott river. A more dangerous shoal, having only 14 feet water, lies N. by W. 4 cables' lengths, from McCrae point, and 3 cables off shore; after which there are no farther dangers, except a small patch of 4¼ fathoms up to the 3-fathoms shoal off Cape George (page 223), at the entrance of St. Peter inlet.

McINTOSH COVE.—From Pringle island, the southern shore of West bay trends to the westward, and at 3¼ miles is McIntosh cove, easily recognized by McIntosh islet, which with the reef uniting it to the main

land, shelters the cove from easterly winds. The anchorage here is good in 4½ fathoms, mud, but there is little room, the cove being only a quarter of a mile across, and the deep water only a cable wide, from 3 fathoms to 3 fathoms on either side.

The Macinnis shoals, of rock, lie off the mouth of this cove, the least water, 18 feet, bearing from McIntosh islet N.W. by W. about 1½ cables' lengths; and from Macinnis point, on the west side of the cove, N.N.E. a quarter of a mile. Vessels may pass between these shoals and the islet, but the widest and best passage is between them and the point. The outermost of these shoals, on which the depth is 22 feet, extends to the distance of three-quarters of a mile N.W. by W. from Macinnis point.

DIRECTIONS.—In approaching McIntosh cove from the eastward, and on arriving within the distance of a mile from it, there is a dangerous reef to be avoided, running out from a shingle beach, inclosing a small pond, 3 cables' lengths to the depth of 3 fathoms, and three-quarters of a mile to 5 fathoms. Macinnis point open to the northward of McIntosh islet, bearing S.W. by W. will lead outside of the whole of this reef.

In approaching the cove from the westward there is also a dangerous reef in the way, the outer extremity of which is distant 4 cables' N. by W. from the peninsula of Big pond; and bears from Macinnis point W.N.W. three-quarters of a mile. The least water on this reef, which runs in nearly to the shore, is 9 feet, and the channel between it and the outermost Macinnis shoal is a quarter of a mile wide. To run through, bring McIntosh islet to bear E. by S., and steer for it until off the mouth of the cove.

BLACK RIVER.—Off the mouth of Black river, 2 miles farther westward, there is another confined anchorage sheltered by McRae islet and its reefs, which to the eastward unite it to the peninsula of Gooseberry pond, and to the north-west run out to the distance of 3¾ cables' lengths. The way to this anchorage is first to the S.S.W., between this reef and Ballam shoal, until the islet and the peninsula of Gooseberry pond are touching and bearing E. by S. ½ S.; and then S.E. for midway between the islet and Murray point, passing between the reef off the former and a shoal with 16 feet water, lying N.W. 3½ cables from the latter, until far enough to be sheltered by the islet and its reefs from north-east winds; but the place is narrow and intricate and only fit for small vessels.

BALLAM SHOAL is an extensive rocky bank, with 17 feet least water, running out three-quarters of a mile to the eastward from Ballam head, from whence to Head Bay cove, which affords shelter to boats the distance is 2 miles.

MACDONALD HARBOUR.—On the northern shore of West bay a group of wooded islands, about 50 feet high, with cliffs of red sand, clay, and boulders, and connected by shingle beaches, when not separated by narrow channels, will be seen extending from George island (page 229) to Ranald islet, a distance of 4 miles to the westward. The anchorage is good between them and the northern shore of the bay, but especially in Macdonald harbour (or Clarke cove), which may be approached either through the narrow channel between George and Cameron islands, or by the wider one between Cameron and Green islands. This last is half a mile wide, but a dangerous reef, with only 5 feet water on it, extends from Cameron island 3 cables' lengths across towards Green island, and reduces the navigable breadth to 2 cables. It is nevertheless, by far the preferable channel, and to enter by it, proceed as follows :—

DIRECTIONS.—Having passed the shoal (17 feet) off Militia point, page 228, steer immediately to the northward until Militia and Pellier points come in one, bearing E. by N. $\frac{3}{4}$ N. Then steer W. by S. $\frac{3}{4}$ S., or so as to keep those marks in one astern, until the eastern sides of George and Robert islands come in line, bearing N. by E. $\frac{1}{2}$ E., when the vessel will be between the Nameless and George shoals. The course should then be altered to W. $\frac{1}{2}$ S., steering for Green island until the northern sides of Clarke and Rook islands come in line, then W. by N. $\frac{1}{2}$ N. towards the last-named marks, keeping them in line, and they will lead in between Green island and the dangerous reef off Cameron island, until the western side of Green island bears South, when by altering the course to N.N.W. $\frac{1}{2}$ W., the vessel will pass nearly midway between the shallow water off the south-western side of Cameron island and the Rook shoal, which, with 17 feet water on it, lies N. by E. $\frac{1}{2}$ E., 3 cables from the eastern end of Rook island.

Continue the N.N.W. $\frac{1}{2}$ W. course until within the distance of 1 or 2 cables from Clarke point, or until the eastern extreme of Cow island is seen over the shingle beach which unites the two parts of Rook island, bearing S.S.W. $\frac{3}{4}$ W., then haul to the north-east into the harbour, observing that the leading marks just given clear the 3-fathoms patch which lies $2\frac{1}{4}$ cables off the north-western point of Cameron island. The vessel will be within that patch when George island opens out to the north-west of Cameron island, and will avoid the dangerous reef which runs out a quarter of a mile to the westward from the point which separates the two coves at the head of the harbour, either by anchoring immediately after the points on the northern side of Cameron island come in one bearing S.E. $\frac{1}{2}$ E., or by keeping Rook island open to the westward of Cameron island, for these islands kept touching, and bearing S.W. $\frac{1}{2}$ S., will lead clear to the north-west of the reef, and into the mouth of the

north-west cove, which can be entered without difficulty by vessels of large draught.

The approach to Macdonald harbour from the westward, through a narrow channel, carrying 20 feet water, is rendered dangerous by the reef, with only 5 feet on it, which stretches nearly across from the mainland to Low island.

GREEN, CALF, and TAILOR ISLANDS.—The shallow water does not extend beyond a cable's length from the outer points of Green, Calf, and Tailor islands, but there is a rocky bank with 25 feet water, distant nearly three-quarters of a mile E. by S. ½ S. from Calf island; and there is also the Tailor shoal, which, with 22 feet water on it, lies S.E. by S. half a mile from Tailor island, and from which the eastern extreme of Calf and Rook islands appear in one. There are 30 fathoms water close to this shoal, and the deepest water in the bay, 39 fathoms, is distant from it three-quarters of a mile to the southward.

ANCHORAGE.—Vessels desiring to proceed to the confined but safe anchorage between Tailor and Cow islands, will find a clear channel between the Tailor shoal and the islands. In running in between the islands, keep in mid-channel, and anchor midway between the northern end of Tailor island and the southern peninsula of Cow island, with the south-western points of the latter, and of Calf island in one, and with the eastern end of Rook island seen over the shingle beach which unites the two peninsulas of Cow island, bearing E. by N. ½ N.; the depth will then be 7 fathoms, mud, but the place is inconveniently small for large vessels, the deep water being only a little better than 2 cables' lengths across in the widest part.

Shallow water connects Tailor island with Low island, which lies a quarter of a mile from it to the northward; and there is a dangerous reef, dry in part, running out from the northern end of Tailor island, a quarter of a mile to the north-east, so as to leave a channel through to the northward of the islands, a cable wide, with 4 fathoms water, and which passes within half a cable's length of Cow island, from which, the shallow water extends a cable's length to the northward.

FLODA and CRAMMOND ISLANDS.—Floda island and the two Crammond islands, form a separate group 1¾ miles in length, and lying one mile farther to the south-west, with a clear passage between them and Ranald islet. They are of similar formation to those already described, presenting cliffs of red sand and clay to the sea, and being from 50 to 70 feet in height.

Between the two Crammond islands, there is a secure harbour for small craft and boats, having off its south-eastern entrance, Smith shoal, one of the

principal dangers in West bay. The least water, only 3 feet, is on the south-west side of the shoal, and bears S.S.E. nearly $3\frac{1}{4}$ cables from the south point of the eastern Crammond island, and E. by S. $5\frac{1}{2}$ cables from the south point of the western island, from which a reef runs out to the distance of 3 cables towards it, leaving only a narrow channel between. The south-east extremes of Floda and Tailor islands touching, and bearing N.E., lead close outside of this shoal, which is a quarter of a mile in diameter.

The anchorage is not good around these islands, because of the great depth of water, which amounts to 25 fathoms between them and Mid shoal, which has 3 fathoms on it, and lies N. by W. $\frac{1}{2}$ W. $\frac{7}{8}$ths of a mile from the north-east point of the Crammond islands; and with Ranald islet open to the southward of Tailor island and bearing E. $\frac{1}{2}$ S. The south points of Tailor island and of Ranald islet in one, will lead clear to the southward of this shoal, where the depth varies from $4\frac{1}{2}$ to 20 fathoms.

There is a deep and clear channel on the west side of the Crammond islands, between them and Spruce and Widow points, the only dangers being a shoal, with 15 feet least water, in Malcolm cove, and the reefs off either end of Dumpling island, which lies two-thirds of a mile N.W. from the Crammond islands, and a third of a mile E. by S. $\frac{1}{2}$ S. from Widow point.

McLEOD and ROSS CREEKS, and NORTH COVE, to the northward of Widow point, afford secure anchorage in from 3 to $3\frac{1}{2}$ fathoms, mud; but must be entered through channels only 80 yards wide, from the depth of 3 fathoms to 3 fathoms on either side.

HEAD BAY COVE.—The head of West bay between Spruce point and Ballam head, is $1\frac{3}{4}$ miles wide, and 3 miles deep from Spruce point to Head Bay cove, which affords shelter to boats, as already mentioned in page 231. The head of the bay has no secure anchorage, and on its northern shore there are dangerous reefs, especially at Magnus islet, which lies W.S.W. nearly one mile from Spruce point, and a quarter of a mile off shore. Off the first point, westward of Spruce point, a reef extends E. by S., half a mile, and off Magnus islet, 2 cables' lengths in the same direction. A reef partly dry connects this islet with a point a third of a mile to the westward, and then runs out half a mile to the southward to the depth of 3 fathoms, and an equal distance farther with 22 feet, stretching two-thirds of the distance across the head of the bay, and to within half a mile of Ballam head.

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