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THE

AMERICAN COAST PILOT:

CONTAINING

DIRECTIONS

FOR THE

PRINCIPAL HARBORS, CAPES AND HEADLANDS,

ON THE

COASTS OF NORTH AND SOUTH AMERICA:

DESCRIBING THE

SOUNDINGS, BEARINGS OF THE LIGHTHOUSES AND BEACONS FROM THE ROCKS, SHOALS, LEDGES, &c.

WITH THE PREVAILING

WINDS, SETTING OF THE CURRENTS, &c.

AND THE

LATITUDES AND LONGITUDES

OF THE

PRINCIPAL HARBORS AND CAPES;

TOGETHER WITH

A TIDE TABLE.

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Entered according to Act of Congress, in the year 1842, by E. & G. W. BLUNT, in the Clerk's Office of the District Court of the Southern District of New York.

N.B. As some improvements have been made since this work commenced, the reader is referred to the APPENDIX.

CHRONOMETERS rated, sold, and repaired, by E. & G. W. BLUNT.—See their advertisement in this work.

Printed by J. M. Elliott, 33 Liberty street, N. Y

Preface to the Twelfth Edition of the American Coast Pilot.

NEARLY *forty years* have elapsed since the subscriber commenced this work. To it he has devoted the largest portion of his life, unwearied labor, and great expense; and the reception it has met with from that respectable class of society by whom it is used, may be inferred from the fact, that ELEVEN EDITIONS, comprising *thirty-seven thousand* copies, have been sold, previous to the publication of the present edition.

The difficulties of procuring all the improvements incident to a work of this character, not only intended to enable the mariner to recognize the coast at a distance; but to direct him into a port when pilots cannot be obtained, render it a work of great labor and responsibility. The life of the most experienced is more endangered when he approaches the coast, than when exposed to the tempests which agitate the mid-ocean. Pilots, who are not always to be found in the discharge of their duty, are often prevented by storms and violent winds from offering their services to vessels endeavoring to make a harbor. In such cases, unless the masters are acquainted with the port, the safety of the vessel depends upon the accuracy of the Sailing Directions. Charts are intended rather to give a general idea of the coast, than minute and accurate descriptions of particular harbors. It is, therefore, to their printed directions that they must resort, to procure information which at such moments is vitally important. Their instruments and charts, by which they have been enabled to shape their course through a trackless ocean, are rendered useless from their ignorance of the channel by which they are to enter the harbor; and mariners, who have escaped all former dangers of the voyage, are often shipwrecked upon some sunken rock or shoal, at the entrance of their destined port. The knowledge of such dangers, important as it is to seamen generally, is particularly so to those of the United States. Navigating waters filled with shifting sand banks and bars, which are formed by the Gulf Stream, and by the mighty rivers which discharge themselves from the coast of the North American continent, they require no ordinary skill and knowledge to avoid those extensive and intricate shoals that line our shores. This coast is rendered still more dangerous by rapid tides and eddies peculiar to the American seas, and by a strong current running counter to the Gulf Stream, from the Banks of Newfoundland to Cape Florida. The boisterous and variable weather, so common in this climate, also tends to increase the difficulties and dangers of our coasting trade.

The Charts of the American Coast of foreign publication, were drawn from information obtained previous to the revolution, from the imperfect sketches of such ports as the policy of the British government caused to be surveyed at the time it held us as colonies. These were few in number, and, since the publication of American charts, the English charts have fallen entirely into disuse. In general the mariners were left to acquire their knowledge from the shipwrecks of others. Those we now publish, are from authentic sources; and from the surveys of our own government, the observation of ship-masters, and our own exertions, we derive that information which is here published concerning the coast of the United States.

In preparing the *American Coast Pilot* for press, recourse has been had to every Nautical work of merit; and with the assurance that neither pains nor expense have been spared, it is presented to the world as perfect as the nature of the work will admit. Every source of marine intelligence which

our country affords has been successively resorted to. Letters have been addressed to the Collectors and Pilots in the several ports of the United States, requesting nautical information, which they have given with commendable promptitude.

Surveys, in pursuance of various acts of Congress, have been made of Savannah River, Capes Fear, Hatteras, and Look-out, of the entrance of the Chesapeake, the river Darien, Isles of Shoals, Portsmouth, Boston, and Newport Harbors; copies of which the author has been permitted to take, and which are inserted in this edition of the Pilot. These, however, are but part of the improvements. The Bahama Bank, and the adjacent keys, which lie directly in the course of all vessels bound to New Orleans and Havana, and which have long been the dread of our West India mariners, were surveyed in 1820, at the expense of the subscriber. The next year, the sloop Orbit, a surveying vessel in his employ, was sent to examine the South Shoal of Nantucket, the extent and situation of which he had long suspected to be incorrectly described. It was then ascertained that this Shoal, which had been laid down in all the English charts, as extending to the south as far as lat. 40° 42′ N., in fact terminated in lat. 41° 4′ N. The importance of this discovery to the navigation of the United States, may be easily conceived. Heretofore, mariners bound from Europe, or from the eastern ports to New York, Philadelphia, or any of the southern ports, in their desire to avoid this dangerous shoal, kept so far to the south-east as often to run into the Gulf Stream, and were thereby retarded from 60 to 70 miles per day. By this survey, a clear and perfectly safe channel, twenty-two miles wide, is added to the space, supposed to be between the stream and the shoal, which will enable them to keep more to the north-west, and to take advantage of the south-west current on the inner edge of the Gulf. An average gain of twenty-four hours may be thus made in the home passage of most European traders.

The accuracy of this survey, which was at first disputed, has been fully proved, by two different expeditions subsequently sent from Nantucket to ascertain the extent of the shoal.

The surveying sloop Orbit, also accompanied a vessel sent by Capt. *Isaac Hull*, at the request of the subscriber, to examine St. George's Bank, and the result is published in this edition of the American Coast Pilot.

Since the publication of the eleventh edition, Messrs. *E. & G. W. Blunt* have made a minute survey of Long Island Sound, and also completed their survey of New York Harbor. Great improvements have been made in the directions for the coasts of Newfoundland and Nova Scotia, for which the author is indebted to the surveys of Messrs. *Bullock, Lane, and Lockwood*, under the direction of the British Admiralty. He has also availed himself of the labors of Baron *Roussin*, who, since the publication of the last edition of the Pilot, surveyed the coast of Brazil, from St. Catharine to Maranham, by order of the French Government, and of the continuation of that survey from St. Catharine's to the River La Plata, by Lt. *Barrel*. To the care and ability of Capt. *King*, of the British Navy, who has completed the survey of the Straits of Magellan, he is indebted for the directions for those straits in the following work.

To. Capt. *Beaufort*, hydrographer to the British Admiralty, Capt. *R. Owen*, of the British Navy, Don *Martin F. de Navarette*, hydrographer to the Spanish government, Lt. Col. *Abert*, of the U. S. topographical engineers, and to the officers in the British, French, Danish, and Dutch service, his thanks are particularly due for the new and valuable information which they have voluntarily furnished of the coasts that have fallen under their observation, and in a manner which indicates, that in their opinion, the

advancement of the science of hydrography is the common interest of all nations.

Many improvements are made in this, which have increased its contents one-third over the last edition, by sailing directions for every harbor in the West Indies, Spanish Main, &c. &c., with a full description of the many Beacons, Buoys, and the new Lighthouses, which have been erected on the coast of the U. S.; together with the alterations that have been made in some of the Lighthouses, and a complete revision of the Latitudes and Longitudes, adapted to recent observations.

These are part of the improvements of the present edition; though some material corrections have been made, whenever the author was satisfied, by the testimony of mariners, or by surveys, that his former directions were inaccurate. Alterations have not, however, been made, unless upon stronger evidence than what prompted him to insert the original directions.

In presenting the *TWELFTH EDITION* of the American Coast Pilot to the public, the author does not flatter himself that it will prove entirely free from errors. The shifting nature of certain parts of the coast, may occasionally present deviations from the present directions. Imperfection too is the lot of man, and in attempting to give directions for the navigation of a coast 6000 miles in length, and which was discovered long after the European coast had been fully explored, he is sensible that he has undertaken a duty, the performance of which belonged RATHER TO THE GOVERNMENT THAN TO AN INDIVIDUAL. Of such a momentous task, it is matter of astonishment that so much has been done; and not that so much remains to be performed. During the many years devoted to its execution, his zeal has not been excited, nor his industry quickened by the consciousness that he was engaged in a brilliant undertaking, which would attract the attention of mankind; neither was there opportunity or place in a work addressed to a class using a peculiar dialect, and who required only perspicuity and accuracy, for the beauties of style and language. His pecuniary reward has hitherto been nothing, the profits of the work having been wholly absorbed in the expense of improvements.

It is, however, no small satisfaction to reflect, that the average rate of insurance, since the first publication of the Pilot, has been diminished more than one half upon coasting vessels, and four-fifths upon vessels bound to New Orleans, and that, among other causes, the improvements in hydrography must have contributed to effect this great reduction. Still more satisfactory is the consciousness derived from many public and private acknowledgments that, in no small number of instances, by following his directions, both vessels and crews have been saved from the rage of a merciless element, when the pilots were unable to come to their assistance.

This conviction of the utility of his labors has encouraged him to continue them even when the embarrassments of our commerce had extinguished all expectation of any adequate recompense. For the greater part of his life he has devoted himself to the improvement of American hydrography; and with a constitution broken by exposure and fatigue, and a fortune literally "cast upon the waters," he now retires from the superintendance of a work which his increasing infirmities will not permit him any longer to continue, with an expression of gratitude to that class of our citizens

"Whose march is on the mountain wave,"

for the encouragement given him in their uniform preference of his publications, and parts from them with a wish, that the *American Coast Pilot* may long prove a safe and unerring guide in their journeys through the trackless ocean.

JULY, 1833. EDMUND M. BLUNT.

Preface to the Fourteenth Edition.

In preparing this edition for the press, every care has been taken, many additions have been made, and such errors as existed in the thirteenth edition, and have been discovered, have been corrected.

The editors feel indebted for many communications to this work; more especially to Capt. BEAUFORT, hydrographer to the Admiralty, for the continuation of his valuable favors; to Lieut. BECHER, R. N., and to the invaluable work, the English Nautical Magazine, he edits; to Commanders OWEN and BARNETT, R. N., for their surveys of the West Indies and Great Bahama Bank; to Lieut. Com. POWELL, and Lieut. Jos. F. BORDEN, U. S. N., for their information of the Coast of West Florida; and to Capt. GREEN WALDEN, of the U. S. Revenue Service, for his description of part of the Coast and Harbors of the State of Maine. WILLIAM C. REDFIELD, Esq., of this city, has contributed the articles on Storms and Currents.

The Tables of Longitudes and Latitudes have undergone an entire revision, and have been adapted to those observers who have been deemed most worthy of credit, viz:

The Gulf of St. Lawrence and adjacent coasts, from the observation of Capt. R. N. BAYFIELD, R. N., and other British officers. Those of our own coasts, from different authorities; but more especially on our southwestern coast, to Capt. A. TALCOTT, who determined the longitude and latitude of the Balize, and the other mouths of the Mississippi, after many observations. Major J. D. GRAHAM, U. S. T. E., who determined the longitude and latitude of the Sabine; and Capt. CAMPBELL GRAHAM, U. S. E., for points on the coast of East Florida.

The longitudes and latitudes of the West Indies have been taken from the chronometric surveys of Com. R. OWEN and E. BARNETT, as far as finished; and in the absence of their observations, the French and Spanish authorities have been consulted.

The longitudes and latitudes of the coast of South America, from Maranham to Rio Janeiro, from the observations of Baron ROUSSIN. The English determination of Rio Janeiro has been preferred; from thence to the River La Plate, the French; and from the River La Plate to Cape Horn, the observations of Capts. KING and FITZROY, of the R. N., are adopted.

Much yet remains to be done, to make this work as perfect as the editors desire. This is only to be attained by continued industry, by collecting and carefully collating the various descriptions of places, sailing directions, surveys of harbors, coasts, &c. The important survey of the coasts of the United States, now in progress, under charge of Professor HASSLER, aided by a corps of scientific assistants, will, at a future day, afford materials for further corrections and improvements. To this survey of the American Coast, and to the surveys of the English and French hydrographers, of the coasts, harbors, &c. embraced in this work, to communications and sailing directions from intelligent ship masters, and to an extensive correspondence, the attention of the editors is constantly directed.

JANUARY 1, 1842. E. & G. W. BLUNT.

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COAST OF LABRADOR,

FROM YORK POINT TO SANDWICH HARBOR.

Variation allowed from York Point to Sandwich Harbor $2\frac{3}{4}$ and 3 Points.

YORK, or CHATEAUX BAY, lies about 16 miles N. W. $\frac{3}{4}$ N. from the south-western point of Belle Isle, and 8 leagues N. $\frac{3}{4}$ W. from the Harbor of Quirpon; it may easily be known by two very remarkable hills, situated on Castle and Henley Islands, which lie at the entrance of the bay; these rocky hills appear flat at the tops, and the steep hills around them have the appearance of castle walls; the islands form the eastern side of the entrance to the bay, while the Capes York and Temple are to the westward; but as the mariner may not be able to discover the above hills at a distance, because of the high land behind, the better marks will be, to observe that all the land to the westward is of a high and uniform figure, terminating at the west side of the bay with a conspicuous knob or hillock, while the land to the eastward of Chateaux Bay is hilly and broken, having many islands near the shore; while to the westward there are none.

To sail into Chateaux Bay, you must leave Castle and Henley Islands on your starboard side, and endeavor to keep Point Grenville, which has a beacon upon it, on with the western point of Henley Island; this point is a smooth black rock, having a little dark rock just appearing above water off its point; keep this mark on until you get abreast of Whale Island, then to avoid the middle rock, over which are only 9 feet water, and which lies nearly midway between the east point of Whale Island and the black point of Henley Island, haul over close to Henley Black Rock, or borrow towards, but not too near, to Whale Island, for here it runs off shallow and flat; and when you are so far advanced as to open the narrow channel into Temple Bay, with the view of sailing up into Pitt's Harbor, then haul to the westward, until you bring the outer point of Castle Island a little open of Whale Island; this mark will lead you up into Pitt's Harbor, which is spacious, clear from danger, and well sheltered from all winds; here you may ride in 10 or 14 fathoms, with plenty of timber ready for your use, and every convenience for carrying on your fishery. There is also a narrow passage into Pitt's Harbor, to the northward of Henley Island, through which you will have 3 fathoms water.

One mile to the eastward of Henley Island, lies Seal Island, and $3\frac{1}{2}$ miles further is Duck Island; between these is Goose and Bad Bay, full of rocks both above and below the water, and also open to the easterly winds. To the eastward of Seal Island, distant 6 miles, are St. Peter's Islands, a cluster of barren rocks, within which is St. Peter's Bay, a good place of anchorage, but too much exposed to the south and south-easterly winds to be much frequented.

CAPE CHARLES.—To the north-eastward of St. Peter's Island is Cape Charles, making with a high hill, steep to seaward, and sloping down inland, so that when you are to the westward of Chateaux Bay, it has the appearance of an island. Cape Charles Island lies S. E. by E. $\frac{1}{4}$ E. distant about one and a half mile from Cape Charles; it is of moderate height, and has several small rocks both to the eastward and to the westward of it. From St. Peter's Islands to Charles Island the course is E. N. E. $\frac{1}{4}$ E. distant 14 miles; between them lies Niger Sound, an inlet about two leagues deep, and having several small islands before it; to enter Niger Sound you may pass either to the southward or northward of these islands, and obtain anchorage on the northern side of the sound in 9 fathoms water; the course in will be nearly N. by W.

CAPE CHARLES HARBOR.—From the north point of Cape Charles Island into Cape Charles Harbor, the course is N. W. $\frac{3}{4}$ N. distant 4 miles; this harbor is formed by Eyre and Little Caribou Islands, on the eastern sides, and by the main on the west; there is very good anchorage in from 17 to 22 fathoms water in it, on a muddy bottom, and you may sail in on either side of the centre island; but the best passage is between it and Little Caribou.

From Cape Charles Island to the Battle Islands the course is E. N. E. $\frac{1}{4}$ N. and the distance $4\frac{1}{2}$ miles; this course will carry you clear to the eastward of the rocks which lie a large mile to the eastward of northernmost Battle Island, which will appear high and round at the top.

From the northernmost Battle Island to the River Islands, your course will be N. W. $\frac{1}{4}$ W. distant 2 leagues: here, to the westward of Pocklington, which is one of the River Islands, you will find anchorage in 30 and 35 fathoms water, with a bottom of mud; and vessels may pass to the southward of these islands up the river St. Lewis.

CUTTER HARBOR.—From the south point of Pocklington Island to Cutter Harbor, the course is W. $\frac{3}{4}$ S. distant one mile: in this harbor there is good anchorage for small vessels.

ST. LEWIS RIVER.—From the northernmost Battle Island, to the entrance of the River St. Lewis, the course is N. N. W. $\frac{3}{4}$ W. distant 7 miles; steer in N. W. $\frac{1}{4}$ W. 5 miles, then N. N. W. $\frac{1}{2}$ W. 8 miles, to Woody Island. When you are about 4 miles up this river from its entrance, you will find good anchorage, and this will continue until you arrive at Woody Island; but above that the river becomes intricate and has many shoals. The north point of the river is low for about 2 miles up, then both sides become rather high and woody; at the head of the river are different kinds of very fine wood, birch, fir, juniper, and spruce; and the river is plentifully stored with salmon.

ST. LEWIS'S SOUND.—One mile to the northward of the north point of St. Lewis River lies the entrance to St. Lewis's Sound, which runs up nearly N. W. about 3 miles, having very good anchorage at its upper part, but care should be taken, lest a shoal, which stretches off from a sandy beach on the larboard side, about 2 miles within the entrance, should do you any injury; you will therefore be sure to give this a good berth in passing.

DEER HARBOR.—From the northernmost Battle Island, to the entrance of Deer Harbor, the course is N. N. W. $\frac{1}{2}$ N. distant $2\frac{3}{4}$ leagues. This is considered to be a very good harbor, secure from all winds, and in which vessels will find anchorage in from 10 to 18 fathoms; there is no danger in entering, and the best anchorage is at the back of Deer Island, called also Marnham Island. Port Marnham is formed by the east end of Marnham Island and the main to the north and eastward of it.

CAPE ST. LEWIS.—From the northernmost Battle Island, to Cape St. Lewis, the course is N. $\frac{1}{4}$ W. distant 5 miles; this cape is high ragged land; a quarter of a mile from the point there are two flat rocky islets, and several sunken rocks about the point of the cape; round the point is the entrance of a small cove running in S. W. $\frac{3}{4}$ W. half a mile; it is commonly called Deep Water Creek, being very narrow, and having from 20 to 40 fathoms within it. About $1\frac{1}{2}$ mile N. N. W. $\frac{3}{4}$ N. from the Cape, is Fox Harbor, which is small and fit for shallops, but appears to be a convenient place for the fisheries.

PETTY HARBOR.—From the northern part of Cape St. Lewis, to the south head of Petty Harbor Bay, the course is about N. N. E. $\frac{3}{4}$ E. distant $1\frac{1}{2}$ mile; the shores are bold and lofty; the entrance is a mile and a half wide, and the north point bears from the southern point N. E. by N.; the bay runs up nearly N. W. by N. full one mile, having from 20 to 40 fathoms water in it. At the bottom of the bay you will perceive Petty Harbor; the entrance is to the northward of a low point of land, which shuts the harbor in from the sea, so as to render it very difficult to distinguish its situation; it is not above 50 fathoms broad at the entrance, with 5 fathoms mid-channel, and 3 towards the sides; but this narrow passage continues only a short way, for, having passed through it, the harbor opens wide, and vessels will have plenty of room, and may anchor in any part, in from 7 to 12 fathoms, lying land-locked.

From the north head of Petty Harbor Bay to Point Spear, the course is N. E. $\frac{1}{2}$ N. distant $2\frac{1}{4}$ miles; and from Cape Lewis to Cape Spear, in nearly the same direction, $6\frac{1}{2}$ miles; between are Barren Bay and Spear Harbor; Barren Bay is a little to the northward of the northern part of Petty Harbor Bay, and affords no shelter; but Spear Harbor, which lies to the southward of Point Spear, is a very excellent harbor; in coming from the northward, and making Point Spear, you will open two islands, in the bottom of a small bay; the best passage into Spear Harbor is between these islands; keep the northern islands close on board, there being 4 fathoms along side of it, and after you get about a cable's length within the islands, steer for the middle of the harbor, and anchor in 7 or 8 fathoms; there is good room to moor. Small vessels may go on either side of the islands, the least water being 2 fathoms; but you ought to observe that, in coming from the southward, you will only be able to distinguish one island, for the northernmost islands will be shut in with the land, so as not to be seen until you get within the heads.

SOPHIA, CHARLOTTE, and MECKLENBURGH HARBORS.—From Point Spear to the entrance of these three harbors, the course is N. W. by N. about 3 miles; between are several small but high islands, lying within half a mile of the shore; these are commonly called Spear Islands; they are bold to, and there are channels between them with 20 fathoms water. N. E. by E. $\frac{1}{4}$ E. from the southern head of the entrance to the three harbors lie two small islands, close together, and therefore named the Double Island; these appear to be as high as they are broad; about a cable's length to the eastward of these islands are two sunken rocks, over which the sea, in bad weather, constantly breaks. Nearly in the middle of the entrance also lie two other islands, being so close to each other as to seem one island; these are steep to, and ships may pass on either side of them in 12, 13, and 14 fathoms, anchoring within them, in Queen's Road, in 16 fathoms; but to the southward of these islands you will find the widest passage, and most room for ships to work out.

Sophia Harbor.—The first and southernmost of these three harbors is Sophia Harbor, running in S. S. W. about $1\frac{1}{2}$ mile, with from 10 to 15 fathoms water; it then trends away, round a low point to the eastward, and becomes a mile broad; it is thence shoal water, and fit only for small vessels.

Port Charlotte is the middle harbor, and fit for any ships; there is a low flat island on the starboard side of its entrance, from which runs a reef of rocks one third of the channel over; to avoid this, keep the southern side on board; you will then have 9 fathoms close to the shore, until you get a quarter of a mile up within the harbor; you may then anchor in any part in from 12 to 17 fathoms, only giving the starboard side a berth to avoid a reef that lies on that side.

Mecklenburgh Harbor is the northernmost of the three harbors, and turns in N. N. W. ½ N. and N. W. by N. about two miles; in the lower part of this harbor there are 20 fathoms, but as you advance the water lessens, and in the upper part there are no more than 12 fathoms for ships to moor in. To sail up to the head of the bay, you must keep the larboard side nearest, in order to avoid the ledge of rocks that lies on the starboard, about 30 fathoms from the shore. These rocks lie within the narrowest part of the harbor, and above the low point on the starboard side; the best anchorage is at the head of the harbor.

ST. FRANCIS HARBOR.—From Point Spear to Cape St. Francis, the course and distance are nearly north, 6 miles, and from the islands at the entrance of the three harbors to Cape St. Francis N. E. ¾ N. about 5 miles; between them, and nearly half a mile to the westward of the cape, is St. Francis Harbor. This is a snug and secure harbor, though small, and generally filled with vessels during the fishing season, considerable fisheries being carried on its vicinity. To enter this harbor there are two entrances, one being to the northward, the other to the south-westward of Pigeon Island, this island lying directly before its entrance; the south-eastern channel leads to a small but narrow inlet, called Round Harbor; every where clean ground, with 10 fathoms in the channel as you enter, and the depth gradually decreasing as you advance towards its head, where you have 5 and 3 fathoms. In entering to the south-westward for St. Francis Harbor, you should beware of and give a berth to the western side of Pigeon Island, for a rocky reef off it; give this a berth, proceed on N. N. E. ½ N. and having got fairly between the two points of the harbor, you will perceive on your starboard side a small white rock; go no nearer to it than 7 fathoms, steer up north, and having passed mid-channel, or rather nearer the starboard shore, the rocks above water, which you will see on each side of you, turn westerly, and anchor in 4 or 5 fathoms. Small vessels go to Birnell's Beach, or up to the cove at the northern extremity of the harbor.

Cape St. Francis is the eastern point of an island, between which and Granby Island is a very narrow passage for boats, with 4 fathoms water within it. From this cape in a N. N. Westerly direction, about ¾ of a mile, is Indian Point, between which and Jasper Island's south-eastern point, is an opening leading into Indian Bight and Shoal Tickle, two narrow coves, the latter being shallow, and with only 2 and 1½ fathoms water in it. To the northward of Indian Point are Hare and Fox Islands, having a narrow passage running northward between them; on crossing from Indian Bight to the channel, you will have deep water, but when you enter the passage it will shallow to 5, 4, 3, and 2 fathoms; this flat will continue for a quarter of a mile, you then deepen your water again to 5, 7, 10, and 12 fathoms; vessels frequently anchor in this place, on the western side of Hare Island, or, rounding the northern end of Fox Island, run through Pearce's Tickle into Sealing Bight.

SEALING BIGHT is a very commodious and convenient place for the fisheries; the best anchorage is on the southern part of the bay, to the westward of Jasper Island; here you may safely ride in 8, 10, or 11 fathoms, or further in with less water. There are several coves situated along shore, to the northward of this anchorage, where small vessels may anchor; fresh water can easily be obtained, but wood is scarce; the southern entrance to this place is between Indian Point and Jasper Island, on one side, and Hare and Fox Islands on the other; the water is deep, and there is no danger, except a reef which stretches out to the south-westward from Gull Island, over which the sea breaks very high in stormy weather: it will, therefore, to avoid this reef, be always prudent to borrow close towards Indian Point, in either sailing in or out of Sealing Bight. Merchantman Harbor is about 2 miles W. ½ S. from St. Francis Island; it is small, but has from 7 to 15 fathoms water.

FISHING SHIP HARBOR.—From St. Francis Island to the northernmost Fishing Island, the course is N. N. E. ¾ N. distant three miles. The Fishing Islands are three in number; the two northern ones are connected by a beach, which, with the main, forms Fishing Ship Harbor, where vessels may ride land-locked, and secure from all winds, in from 5 to 14 fathoms water, the entrance being to the southward of the southern Fishing Island; the best passage will be between the two western islands, that entrance bearing from Hare Island N. by W.; there is no danger in this channel, and vessels may sail right through it, in nearly a N. by W. direction, up to the very head of the harbor, and anchor in 12 fathoms, having good room for ships to moor; there are two other passages into this place, one to the westward from the entrance of Gilbert's River, the other to the northward of all the Fishing Islands; the latter has 7 fathoms throughout, but is so narrow that you will have some difficulty in discovering the opening.

GILBERT'S RIVER.—Between Fishing Islands and Granby Island is the northern entrance to Gilbert's River; the southern entrance is between Denbigh Island and the main, and this is much the wider of the two; there is also a channel between Denbigh and Granby Islands. The passage in has deep water every where; the course of the river is nearly N. W. by N. for about 6 miles; it then divides into two branches, one running N. W. by N. 7 or 8 miles, the other S. W. by W. about 6 miles: both these branches are full of rocks, small islands, and shoals; but in the middle the anchorage is good all the way up from 20 to 10 fathoms; this river has also a passage out to sea, between Hare and the Fishing Islands.

CAPE ST. MICHAEL.—Six miles N. N. E. ¼ N. from the northernmost Fishing Island, and 16 miles N. N. E. ¾ N. from Point Spear, is Cape St. Michael, high and steep, and easily known by a large bay to the northward of it.

OCCASIONAL HARBOR.—About 2¼ miles to the southward of Cape St. Michael is Occasional Harbor, easily known by the twins, two large rocks lying two-thirds of a mile outside of the entrance; they are very near each other, and vessels may pass on either side of them; the entrance to the harbor is between two high lands, and runs in W. by N. for 2 miles, then N. W. by N.; both sides are steep to, without any dangers, and having good anchorage in from 10 to 7 fathoms, about 2 miles from the entrance: the wind between the high land always sets right into or out of the harbor.

ST. MICHAEL'S BAY.—From Cape St. Michael to Cape Bluff, the course is nearly N. N. E. about 7½ miles, and these two capes form the points of entrance to the Bay of St. Michael, which contains a vast number of islands, inlets, and rivers; the largest island is named Square Island, lying at the mouth of the bay, and being 3½ miles long and very high; its N. E. point forms a lofty round hill, and makes, in coming from the southward, like a separate island, being only joined by a narrow neck of land; the best anchorage for small vessels is on the southern side of St. Michael's Bay; to go there you should keep Cape St. Michael's shore on board, then run along the south side of the first island you meet with, which is called Long Island, till you get nearly to its western end, there you may anchor in from 12 to 20 fathoms, land-locked, and can work out to sea again on either side of the island. From Cape St. Michael to the entrance of Square Island Harbor, the course is N. N. W. 3½ miles; at the entrance lies a small island of moderate height, to the westward of which is the best passage into the harbor, there being only 2 fathoms in that to the eastward of it. About a league N. N. W. from Square Island round hill is the entrance to Deadman's Harbor, which is formed by a number of little islands, and fit only for vessels of small dimensions. There is a passage between these islands and Cape Bluff, by which vessels may put out to sea.

Cape Bluff is very high land, rugged at top, and steep toward the sea: it may be seen 15 or 16 leagues; Cape Bluff Harbor is a small place, and unfit for large vessels; to sail into it you should keep the cape on board until you reach a small island, which you should pass to the eastward, and then anchor. The several bays and inlets in St. Michael's Bay are well stored with wood.

From Cape Bluff to Barren Island, the course is N. Eastward about one league; and from the south point of Barren Island to Snug Harbor, N. W. by W. 1½ mile. Snug is a small harbor, but in it is very good anchorage in 26 fathoms, and no danger to be apprehended either in sailing in or out of it. About one mile to the northward of Barren is Stony Island, and within these islands, on the main, are Martin and Otter Bays; in the northernmost is good anchorage, and no invisible danger in entering; wood and water are plentiful.

DUCK HARBOR lies on the western side of Stony Island, and is a very convenient place for small vessels; large ships may also anchor between the west point of Stony and Double Islands, in from 20 to 24 fathoms, sailing from thence to seaward on either side of Stony Island in great safety.

HAWKE BAY.—About one mile to the northward of Stony Island lies Hawke Island, within which is Hawke Bay, running in westerly 2 leagues; it then divides into two branches, one going W. by S. 6 miles, the other N. W. by W. 5 miles: the shores of these are well supplied with wood. After you get within Pigeon Island, the anchorage is good up to the very head of both branches.

EAGLE COVE lies on the south side of Hawke Island; this place affords good riding for large ships in 30 and 40 fathoms water, and also for smaller vessels in 7 and 8 fathoms at the upper end of the bay.

CAPLIN BAY.—On the main, within Hawke Island, and nearly 5 miles E. by N. from Hawke Bay, is Caplin Bay, having good anchorage and plenty of wood.

PARTRIDGE BAY lies 4½ miles to the northward of Hawke Island; the anchorage is good, but the bay is difficult of access, unless to those who are well acquainted with the place, on account of the numerous small islands which encumber its entrance; but the land hereabout may be very easily known, for the southern point of the bay is a remarkable high table hill of very barren appearance, and all the land between it and St. Michael's Cape is high, while that to the northward is low.

SEAL ISLANDS.—From Cape St. Michael to the southernmost Seal Island, the course is N. E. ½ N. distant 9 leagues, and from thence to Round Hill Island, N. E. 11½ miles; this latter island is the easternmost land on this part of the coast, and may also be recognized by a remarkable high round hill on the western part of it.

SHALLOW BAY.—From Round Hill Island to Spotted Island, the course is N. N. W. ½ N. distant 4½ miles; and from Spotted Island the land turns N. N. Westerly, and is fronted with numerous Islands. From the southernmost Seal Island to White Rock, the course is N. N. E. ½ E. about 5 miles; and from this rock to enter Shallow Bay, you must steer W. ½ S. nearly 4 miles; there is very fair anchorage within this bay, and no danger, excepting a small rock which lies off a cove on the larboard hand, about one-third over the bay; this rock is visible at low water, and at other times the sea breaks over it; there is little wood visible on the shores of this bay.

From White Rock to Porcupine Island, the course is N. N. W. distant 2 leagues; this island is high, barren, and steep to; vessels may pass on either side of it to Porcupine Bay, where the riding is good, but little or no wood.

SANDY BAY lies on the southern part of the Island of Ponds, and N. ½ W. from White Rock, from which it is distant 5 miles, there is good anchorage in this bay, with 10 fathoms water, on a bottom of sand, and would be a very convenient resort for the fishing ships, but for the total absence of wood. Between this bay and Spotted Island are numerous islands and rocks, both above and under water, rendering this part of the coast extremely dangerous.

SPOTTED ISLAND is high barren land, and may be recognized by several white spots on its eastern side; it is about 3 miles long, and of nearly a similar breadth; the northern part lying in latitude 53° 30′ N. To the westward, and within side this island, is Rocky Bay; to sail into this bay, you should run in to the northward of Spotted Island, and go between either of the islands that lie before the entrance of the bay; but there is no good anchorage in it, the bottom being so rocky, until you get between Level Point and Eagle Island, where you may ride in 8 or 10 fathoms, the ground good and clean, only taking care to give Level Point a free berth; the best anchorage will be on the western side of Eagle Island, in 8 or 9 fathoms, mud. In passing between Eagle Rocks and the Duck Rocks, you may borrow on either side to within two-thirds of the length of a cable, or you may run up and anchor on the southern side of Narrow Island, in Narrow Harbor, and be handy for both wooding and watering.

From Spotted Island to Wolf Rock, the course is N. N. E. ½ N. about 18 miles; this rock is above water, and lies 14 miles from the main; there are some sunken rocks about it, and several islands between it and the coast. About two miles to the northward of the entrance to Rocky Bay, is Indian Island; this is remarkable high land, particularly at the western end; between the island and the main is tolerably good shelter for small vessels, and it appears to be a fit place for a seal fishery.

SAND HILL COVE.—This place is so called from several sand hills lying on the southern side of its entrance; it is situated 4 good leagues to the westward of Indian Island; here the anchorage is good about half a mile up from its entrance, in 4 or 3 fathoms water, sandy ground. When you are sailing into this cove, you should take care to give the north point a good berth, because of a ledge of rocks which stretches off about a cable's length from the point, and runs westward along shore the length of two cables.

TABLE BAY.—The southern head of this bay lies about 2 leagues N. by W. from Sand Hill Cove, and may be known by a remarkable table hill on the north side of the bay, about 8 miles within the entrance; this hill may be seen from the Wolf Rock, which lies N. W. ½ N. 7½ leagues from the entrance of the bay. In this bay, about 4 miles from its entrance, lies Ledge Island, so called from a ledge of rocks stretching westerly from the island up the bay for 2 miles. On the southern side of this island is anchorage, in 12 or 14 fathoms, in what is called South Harbor; or you can run further up, and anchor in Table Harbor. On the north side of the bay, just within Ledge Island, lies North Harbor, having very good anchorage in it. In sailing up to Table Harbor, you should take care to keep the main land close on board, in order to avoid a rock that lies half way between the ledge that runs off Ledge Island and the main.

The GANNETS are a cluster of islands, lying from 7 to 11 miles off the main land; the outermost island bears from the Wolf Rock N. N. W. ¾ W. distant 10 leagues.

CURLEW HARBOR lies nearly S. W. of the Gannet Islands, on the main, and may be distinguished by a green round island lying before its entrance; the channel into the harbor is between this island and a low point to the southward, having a small rock above water close to the point; there is no danger in sailing into this place; the best anchorage will be about one mile within its entrance; here large ships may ride in safety, bringing the small rock off the entrance point on with the northern point of Long Island; they will then ride in 14 or 15 fathoms water, good holding ground. Long Island lies about 1½ mile N. by W. from Green Island. Small vessels run higher up the bay, and generally anchor in from 10 to 7 fathoms. On the southern side of the harbor is a shoal, lying at a small distance from the shore; wood is scarce in this bay, but water plentiful.

ISTHMUS BAY.—This bay lies round the western point of Curlew Harbor, sailing from whence you should endeavor to keep Great Island on board, in order that you may go clear of a shoal that stretches off the point towards the island; there is also another passage into Isthmus Bay, between the western point and a small bare rock of moderate height, that lies off the south point of the Great Island; this channel is narrow, and has a depth of three fathoms within it; both wood and water may be obtained here.

HARE HARBOR.—One league to the westward is Hare Harbor, fit only for small craft, the bottom being foul, except towards the head, where you may anchor in 3½ fathoms water, the ground tolerably good. Hare Island, which lies before the entrance to the harbor, is high land; the eastern point of Huntingdon Island lies about 2 miles to the northward of Hare Island, and W. S. W. ¾ W. about 13 miles from Gannet Island; it is moderately high, and in length, from east to west, 7 miles; off its eastern point are some small islets, named Sadler's and Leveret's Islands, and a little to the northward of the latter is a rocky flat; these lie 1½ mile off the extreme point of Huntingdon Island. There is a safe passage, above a mile wide, along the southern side of Huntingdon Island; this leads into Huntingdon Harbor, opposite which you may ride safely in from 5 to 13 fathoms water; further in towards the island it shallows, but the best anchorage is behind Egg Island, in 6 fathoms, near that island; here you will be secure from all winds, and ride very convenient for both wooding and watering, there being abundance of both on the island.

SANDWICH BAY, called by the natives Netsbuctoke.—On the south-western side of Huntingdon Island are Earl and Diver Islands, on either side of which is a passage into Sandwich Bay; but the channel between Diver Island and Earl Island, called Diver's Tickle, is very narrow, and has in some places not more than 6 feet water, while that between Diver and Huntingdon's Islands is over a sandy flat of 9, 12, and 18 feet water, and consequently not to be attempted by large vessels. To the eastward is Cartwright's Harbor, leading to the Favorite's Tickle, and thence to Sandwich Bay: this has deeper water, and by keeping the southern land well open of Earl's Island, you will go through it until you reach the Narrows, when the two points forming the Narrows must be brought on with each other, and this will lead between the eastern small island and the main in 4, 7, and 9 fathoms; between the Narrows are 18 fathoms. Sandwich Bay is a very fine harbor, 6 or 8 miles broad, and 6 leagues deep, with plenty of wood and water, and four rivers running into it, abounding with salmon. There is very good riding in a cove on the eastern side of the bay, and also on the northern side, under a mountain; from the shore, at the foot of the mountain, and five miles to the westward, the soundings stretch gradually off the shore, from 5 to 25 fathoms, muddy ground, and extend full three miles from the land. The passage into the bay, on the western side of Huntingdon and Earl Islands, is the widest and best channel, for that to the southward we have just shown to be narrow, shallow, and inconvenient; to enter to the northward of Huntingdon Island you must beware of the flats which lie a little to the northward of Leveret's Island; there is deep water at the entrance, and you will see the Island of Plantation to the northward, a little to the westward of which is Henrietta's Island; between these two is Independent Harbor, a snug retreat running in north, and having every convenience for the fisheries. Directly before this harbor, and in the fairway of the channel to Sandwich, are the Double Islands; in entering you will leave Wedge Island and Bellows Rock to the northward, and Gull Island to the southward, and pass on either side of the Double Islands; your course then will be N. W. by W. 4½ miles; and having got beyond the N. W. point of Huntingdon Island, you will perceive Entrance Island lying midway between the point and the opposite shore: the channel now bends to the S. Westward, and is bounded to the northward by the North River Flats, and to the southward by Huntingdon Flats, the deep water passage being about a mile broad: you may sail in on either side of Entrance Island; proceed W. by S. towards Main Tickle Point; from off this point a spit extends E. N. E. 1½ mile, contracting the channel, and making the navigable passage very narrow for large ships to enter; on the starboard side are the two Brenton Islands, situated in Table Hill Cove: when you get these open of each other, a line passing directly between them, or when the North Brenton opens its own length to the eastward of the southern one, you will clear the spit in 4½ fathoms; when these islands come on with each other, you will pass over the spit in 2 fathoms water: the cross mark is Green and Leading Mark Islands in one; these lead on to the centre of the spit, and are two islands situated on Huntingdon Flats: the leading mark to go through the Main Tickle Passage is Leading Mark Island on Old Man's Head; this will carry you clear of the shoals on both sides, in from 6 to 14 fathoms, right into Sandwich Bay; to sail out of the bay bring the hollow part of Leading Mark Island in one with the gap of Old Man's Head, until you are within three cables' length of the former, then give the island a berth of equal distance in passing, and steer direct for entrance Island.

FROM CHATEAUX BAY TO THE ESQUIMAUX ISLANDS, AT THE ENTRANCE OF THE RIVER ST. LAWRENCE.

Variation allowed 2 Points.

From York Point, the southern entrance of Chateaux Bay, to Barge Point, the course and distance are W. by S. 5½ leagues; from Barge Point to Saddle Island is nearly west 10 miles; between these is Green Bay, a place where small vessels may anchor in 12 fathoms water, but open to the S. Easterly winds.

RED BAY.—This is an excellent harbor, and may always be known by Saddle Island, which lies at its entrance; this island rises up at each end, and sinks down in the middle, somewhat similar to a saddle; there is also a remarkable round hill on the western side of the bay, and opposite to the west end of Saddle Island, which will tend to point out the harbor; the land on the west side of the bay is high, the eastern side rather low, and the head of the bay is high and woody: in sailing into this place there is little danger, the passage is to the westward of Saddle Island, only taking care to give a berth to the rock, which at a quarter ebb is above water, and lies off the western point of the main land, and also not to come too near to the inner part of Saddle Island, as a shoal stretches off it about the length of a cable. The western bay lies in to the northward of the western point, and has very good anchorage with westerly winds, but somewhat open to the eastward; there is no passage, except for boats, to the eastward of Saddle Island; vessels coming from the eastward must be careful to go clear of a small rock, which lies about a mile from the two black rocky islets, which are at the east end of Saddle Island, and near a mile off the shore: the high round hill at the west side of the bay on with the saddle of Saddle Island, will lead you directly upon the rock, and the sea commonly breaks over it.

BLACK BAY lies to the W. S. Westward, distant 10 miles from Saddle Island; the anchorage here is tolerably good, but too much exposed to the S. E. winds. S. W. by S. from Ship Head, which is the western point of entrance to Black Bay, distant 1¾ mile, is St. Modeste Island; it is small and low, but vessels frequently run in to a place within the island, called St. Modeste Bay, and anchor; but this, though occasionally used, cannot be recommended.

WOLF'S COVE, OR L'ANCE DE LOUP.—S. W. by W. from St. Modeste Island, distant 4½ miles, begin some remarkable red cliffs, which continue full 2 miles, and form the eastern point of Wolf's Cove; this is high table land, terminating with steep cliffs towards the sea. The entrance to Wolf's Cove is about 2 miles wide, the two points of the cove bearing from each other S. W. and N. E.; there is good anchorage at the head of this cove in 12 fathoms water, and also on the western side, in Schooner's Cove, where small vessels may lie safely in 7 fathoms, on a bottom of sand.

FORTEAU BAY lies 5 or 6 miles to the westward of Wolf's Cove; the shore between them is rather low: Forteau Bay is about 3 miles broad, and runs in nearly the same distance; on the western side, near the head of the bay, is good riding, in from 10 to 16 fathoms, but exposed to the southward. Off the east point of the bay is a rock, which appears like a shallop under sail; and on the western side of the bay is a fall of water, which, on coming from the eastward, will easily be perceptible. West 7 miles from the western point of Forteau Bay is Island au Bois, and 2 miles westward of that is Green Island; the former of these is of moderate height, and has a good passage round it; it lies in front of Blanc Sablon Bay, where a vessel may occasionally find anchorage; but the ground is loose sand, and will not hold. The channel between Bois and Green Islands is good, and has 11 fathoms water in it; there is a cove on the eastern side of Green Island, where a fishery is sometimes carried on; there is also a passage between Green Island and the main, which leads to Brador Bay and Harbor; but you should be careful to give Grand Point a good berth in passing, as some sunken rocks lie directly off it.

LABRADOR HARBOR.—From Green Island to Island of Ledges, the course is nearly north, distant 5 miles; the Harbor of Brador may readily be known by the land between it and Point Belle's Amour: the point itself is low and green, but about a mile inland it rises up to high table land; and further inland are three remarkable hills, called Our Lady's Bubbies; these are round, and may be seen all along the coast, lying to the N. Eastward about 2 leagues distant from the Island of Ledges; this island is of moderate height, having a great many islets and rocks about it; on its eastern side is Blubber Cove, where small vessels may anchor in 2 and 2½ fathoms. There are two passages into Brador Harbor, but that to the northward of the Island of Ledges is by no means safe, on account of the number of rocks scattered about it. To enter the eastern passage, you must take care to avoid a small rock, which lies about S. W. by W. a quarter of a mile from the low point on the main, where the houses stand; on this rock the sea commonly breaks and shows itself at a quarter ebb: on the eastern side, within this rock, is Shallop Cove;

from the point above the cove a shoal stretches off about a cable's length from the shore, and continues nearly the same distance quite to the head of the harbor.

ESQUIMAUX RIVER AND BAY.—From Point Belle's Amour to the outer Esquimaux Island, the course and distance are W. by S. 10 or 11 miles, N. N. E. about 4 miles from which there is good anchorage, between two high islands, for small vessels; and within these lies the River Esquimaux. From hence to Dog Island is a chain or cluster of small islands and rocks, the easternmost of which are commonly called the Esquimaux Islands; the middle ones, the Old Fort Islands; and the western ones, the Dog Islands: within these, and on the main land, are various good bays and places of shelter; but the entrances to them are so intricate, narrow, and dangerous, that no person, unless well acquainted, should attempt to navigate a vessel through them. These islands extend from the outer Esquimaux Island nearly 4 leagues, and some of them are full 4 miles from the land.

LITTLE BAY.—W. N. W. about 5 miles from the Dog Islands, is Little Bay, in which small vessels may find very good anchorage; nearly a mile to the westward of Little Bay, is the Bay D'Omar; this bay runs up N. E. by N. nearly 3 miles, the land on both sides being very high, but the western shore is the highest; its width is about two cables' length, but off the coves it is broader; outside of the eastern point of the bay are two small islets, a cable's length from land. This bay has good anchorage, the best place being 2 miles within the entrance, opposite a woody cove on the west side, where you will lie secure in 14 and 16 fathoms, with abundance of wood and water. On the west side, also, a mile within the entrance, is a remarkable green cove, but this becomes shoal a short distance from the shore. From the entrance of the Bay D'Omar to Bowl Island, the course and distance are W. S. W. ½ S. 2 miles. This is a remarkable round island, of moderate height, and lies a mile from the main land; about it, and between Bowl Island and Shecatica, are a great number of islets and rocks, the coast being thereby rendered dangerous to navigate, unless you have a fresh of wind; the rocks will then show themselves by the sea breaking over them.

From Bowl Island to Shecatica, the course is W. by N. about 2 leagues; and 3 miles E. N. E. from Shecatica Island is the Bay of Petit Pene, running in N. N. E. about 5 miles; but this place is scarcely fit for vessels to go into, because the water is too deep, the entrance too narrow, the ground bad, and the whole bay open to the southerly winds.

MISTANOGUE BAY lies about 2 miles to the westward of Petit Pene; there is a good channel between the Island Shecatica and the main, and many seals are frequently caught there. Before the entrance to the Bay of Mistanogue lies an island of the same name; here, between the island and the river, the anchorage is good, with from 15 to 20 fathoms water; the ground holds well, and there is room enough to moor. To go into this road, you should pass round the western end of the island, which is bold to, or else round its eastern end, and between it and Shecatica; but this latter passage is fit only for small vessels. In the Bay of Mistanogue the anchorage is good up to the very head, the channel is both long and narrow; the island and the main land, at the entrance, has a barren appearance, and is high; but both wood and water may be obtained in the bay.

SHECATICA BAY runs close in to the westward of Mistanogue Island, and extends many miles up the country, its course bending to the northward, and having various branches and turnings, with numerous islands, capable of giving shelter to vessels of all descriptions; but these are little frequented, and consequently not well known; besides the passages are too narrow for strangers to attempt the navigation of.

SHAG ISLAND AND ROCKS.—Nearly S. W. by W. distant above 2 leagues from the Island of Mistanogue, is the Shag Island and Rocks; the island is small, high, and has a round peaked hill in the middle; to the eastward of it are a number of rocks above water, the outermost lying E. S. E. ½ E. one mile and one-third from the island.

CUMBERLAND HARBOR lies N. N. E. ¾ N. about three miles from the outer Shag Rocks, and may readily be distinguished by a remarkable high hill on the main land, appearing like a castle at its summit, being a steep cliff, looking like walls; this hill lies N. by W. nearly 3½ leagues from the entrance to the harbor. The outer islands, which form the harbor, are called the Duke and Cumberland Islands; these are moderately high, the eastern one making in two round hills. To enter this harbor there is no danger but what appears above water, except one small rock, which lies south about half a mile from the western head; the entrance to the harbor is a quarter of a mile wide, and the inlet half a mile long; from the eastern head you must steer for the inner point on the western side, and after you reach that point, haul over to the eastward, and anchor in from 20 to 7 fathoms, excellent ground, and room enough for any ships; this is by far the most commodious and best harbor on the coast, and also the easiest of access; fresh water is plentiful, but for wood you must go to Shecatica Bay.

SANDY ISLAND BAY.—N. W. by N. about 2½ miles from Shag Island, is the bay and harbor of Sandy Island; to sail into this, you should pass to the eastward of the Murr Rocks, keeping the starboard point of the bay on board; you will then perceive a small rock above water to the N. N. Westward; this lies off the entrance of the harbor; you

may pass on either side of this rock, and then steer in N. N. E. ½ N. for the harbor; there is no other danger; here you will have room enough to moor in 5 and 6 fathoms water, with good ground and safe riding; there is no wood here, but water in plenty.

PORT AND RIVER ST. AUGUSTINE.—The entrance to the Port and River St. Augustine, is between Shag Island and St. Augustine Square; the West Island, which is moderately high, the western part being the highest, and quite low in the middle, but not easily to be distinguished at a distance, on account of the islands within it being much higher; a-third of a mile to the eastward of this is the East Island, somewhat larger, not quite so high, but even at the summit; between these islands, after passing the Chain and Square Islands, is a safe passage for small vessels to enter this port; and they can anchor between the West and Round Islands; or run to the northward, pass Round Island, and stop in 6 or 7 fathoms, with plenty of room to moor. S. W. by W. about half a league from west part of St. Augustine's Islands, is a string of small islands, commonly called St. Augustine's Chain, the outermost of which is a remarkable smooth round rock, and to the westward of this one quarter of a mile, are several rocks under water, over which the sea is constantly breaking; some of these are visible at one-third ebb: half a mile W. S. W. from these is a high black rock above water, and between these two is the best passage for large vessels into the Port of St. Augustine; you should steer from this black rock, towards a remarkable low point, which will bear N. N. E. ¾ N. until you open the port; then haul in and anchor as before directed; or you may steer up the passage between this point and Round Island, and anchor.

THE RIVER ST. AUGUSTINE is 4½ leagues from the entrance of the port, and lies to the N. N. W. having several islands lying in the passage; but the river is shallow, and only fit for boats to enter; there is a sandy bar across, which dries at low water. Two miles up, it divides into two branches, both running to the N. N. Westward for 14 or 15 leagues; wood and water are plentiful.

From St. Augustine's Chain to the bluff head of Great Mecatina Island, the course and distance are W. S. W. 8 leagues and 1 mile; the coast is lined with islands, within and about which are many harbors; the main land in sailing along this part, from Shecatica to Ha Ha Bay, cannot be seen, and the adjacent islands are so high, so numerous, and so near each other, that although there are navigable passages between them, yet you cannot discover their entrances, nor perceive them to be islands, until you get near and entangled among them.

EAGLE HARBOR.—This lies at the western end of Long Island, to the eastward of Ha Ha Bay, and is formed by a cluster of islands, being capable of holding a great number of vessels in security; in it are from 20 to 10 fathoms water, the ground holding well. In order to find out this anchorage, it will be advisable to make for the Great Island of Mecatina, from whence you should shape your course for the Fox Islands, which lie S. S. E. ½ S. one large mile from the westernmost entrance of the harbor; it may also be known by a deep bay to the eastward, without any islands in it, while to the westward there are a great many. But if you intend sailing in to the eastward, you should steer from the Fox Islands N. N. E. ½ E. 2½ miles, into the bay, when you will observe to the N. N. Westward of you, a remarkable high island, round which, to the northward, is a safe passage of 3 fathoms into the harbor, where you will ride with safety, well sheltered from all winds. In the western passage to this harbor, there are 2½ fathoms; this is, however, a narrow channel, fit only for small vessels, and running in between many small islands.

This part of the coast is very dangerous for any vessels to fall in with, in dark and foggy weather, on account of the infinite number of small low islets and rocks about it, many of the latter being under water, and to avoid which no practical mark can be given; it will, therefore, always be advisable and prudent to keep off the coast to a considerable distance.

HA HA BAY lies on the main, to the westward of Eagle Harbor, and has several small islands at its entrance, forming separate entrances; the best of these is that which lies between Seal Point and Round Island, leaving all the islands on the starboard side; this is a wide and safe passage, having no danger but what is visible. Ha Ha Bay runs in to the northward about 7 miles, and has many islands at its head, on the starboard side; within these islands, to the eastward, are numerous anchorages, with from 9 to 20 fathoms water; vessels may also occasionally anchor all along the eastern side of the bay in 12 and 14 fathoms, muddy bottom, but on the western side the water is too deep. N. N. W. ½ N. about two miles from the entrance on the west side, is a high bluff head; round this head N. W. by W. half a mile, is a small, but safe harbor for small vessels, in which you will have 12 fathoms, good ground; this harbor is formed by an island, on either side of which there is a narrow but safe passage.

LITTLE FISH HARBOR is to the southward of Ha Ha Bay, and runs in westerly; it is small, and formed by an island covered with wood; you may sail in on either side of the island; but the northern passage is considered to be the better of the two; in the bay to the southward of the island, is a ledge of rocks, partly visible at all times. S. E. by E. from the Woody Island lies a rock, on which are only 2 fathoms at low water. You

may anchor in the harbor at the back of this island in 7 or 8 fathoms, and have plenty of room to moor. Off the northern point of the entrance to this harbor, called Seal Point, are two little islands, and a small sandy cove, where a seal fishery is carried on.

Between Fish Harbor and Ha Ha Bay there is a very remarkable round high hill, making in a peak, which may serve as a landmark to point out either of these places of anchorage.

GREAT MECATINA ISLAND lies 3 miles off the main land; it is 3½ miles long, and about 3 miles broad, being the most remarkable land at this part of the coast; it rises up in the middle, which is much higher than either of the ends; its E. N. E. point makes like a bluff head, and round this head to the northward, within a cluster of small islands, there is a cove running in about one mile and a half; in this cove vessels can safely anchor, in from 14 to 20 fathoms, good ground, and may obtain both wood and water.

MECATINA HARBOR.—This harbor is formed behind Mecatina Island on the main; it is safe but small, yet will admit vessels of burthen, there being not less than 3 fathoms at low water, in either passage to it; but they must moor head and stern, there being no room to moor otherwise. To sail in through the western passage there is no danger, but to sail in through the eastern channel you must observe the following directions. From the eastern point of Mecatina Island steer north towards the main land; keep that close on board until you get the western point of the island on with the point of Dead Cove; this is a small cove on the main, which lies open to the eastward; the land which forms it is very low, with some brushwood upon it; then sail on in that direction until you get above a stony point, which is to the north side of the said cove; or until you bring the north point of Gull Island, which is a small island lying E. by N. distant one mile from Mecatina Island, on with the E. N. E. point of Mecatina Island; you will then be within a spit of rocks which stretches off the island, and must haul over for Mecatina Island, in order to avoid a ledge which runs off from the point of Dead Cove; and when you bring the western passage open, you may anchor in 6 or 7 fathoms water. Vessels coming from the eastward, and bound for the Harbor of Mecatina, in passing to the northward of Gull Island, should be careful either to keep Gull Island or the main land close on board, in order to avoid a sunken rock that lies near half way between Gull Island and the main, on one part of which there are not above 3 feet water. The highest part of the land between Grand Point and Ha Ha Bay is directly over the Harbor of Mecatina.

THE GRAND POINT of MECATINA is the extremity of a promontory, which runs out from the main land, it is low at the point, but rises inland, sloping gradually up until it becomes of considerable height; it may easily be recognized by the adjacent islands and rocks which are about it; the nearest is a small low rock, not far from the point; two of these islands are much larger, and rise much higher than the others; and the outermost are small, low, rocky islands, lying 2¼ miles off the point. S. E. by E. five miles and a half from the Grand Point are the Murr Islands and Rocks, and these are the most southerly islands on all the coast. The northernmost Murr Island bears from the other north a little westerly, distant one mile: they are remarkable objects, being two barren rocks, of moderate height and steep all round. About half a mile E. S. E. from the southern Murr Island, are the two Murr Rocks, both appearing above water, and E. ½ S. from the same island lies a ledge of rocks, under water, on which the sea generally breaks.

BAY DE PORTAGE.—N. W. by N. from the Murr Islands, distant two leagues, is the Bay de Portage, the land over which makes in a valley, each side being high; at its entrance lies an island of moderate height, which forms the harbor; you may enter on either side of this island, but the eastern passage is fit only for small vessels, there being only 2 fathoms, in some parts of it, at low water. The western channel is sufficiently large and safe for any vessel to turn, there being from 6 to 8 fathoms in it; but they must be careful to avoid two sunken rocks, on which are only 2½ fathoms at low water. The northernmost of these lies from Mutton Island S. by W. distant one mile and a half; the southernmost rocks bear from the Seal Rocks N. E. ¾ N. distant half a mile; they are both bold to, and vessels may borrow within a cable's length of Mutton Island or the Seal Rocks.

COURSES *and* DISTANCES *from Island to Island along the Coast, between Grand Point and Shecatica, which courses will carry you outside of all the other Islands and Rocks.*

From Grand Point of Mecatina to the outer rocks the course and distance are	S.S.E. ½ E.	2¾	miles.
the outer rocks to the Murr Rocks	E.S.E. ½ S.	3¼	do.
Murr Rocks to Flat Island	E.N.E. ½ E.	5	do.
Flat Island to Treble Hill Island	N.E. by N.	5¼	do.
Treble Hill Island to Fox Islands, a cluster of islands lying S. ½ E. from Eagle Harbor	N.N.E. ¾ E.	9	do.
Fox Islands to St. Augustine's Chain	E. by N.	15	do.
St. Augustine's Chain to Shag Island	E.N.E. ½ N.	7½	do.

St. Augustine's Chain to Shag Rocks	E. by N.	9 miles.
Shag Rocks to the east end of Shecatica Island	E.N.E. ¼ E.	9 do.

Courses and Distances along shore, passing within the Great Mecatina Island.

From the outer rocks to the Bay de Portage	N.N.W. ½ N.	4 miles.
do. outer point of Mecatina Island	N. ½ E.	4 do.
outer point of Mecatina Island to Gull Island	E. by N.	1 do.
Gull Island to Green Island, at the entrance of Red Bay	N.E. ½ E.	3 do.
This course will carry you clear of the Shag Rock, so far as you pass outside of Gull Island.		
Gull Island to La Boule Rock, off the N.N.W. end of Mecatina	E.N.E. ½ N.	4 do.
La Boule Rock to Green Island	W. by N.	1½ do.
La Boule Rock to Duck Island	N. ¾ W.	3 do.
Duck Island to Round Island, Ha Ha Bay	N.E. ½ N.	1¼ do.
Round Island into Little Fish Harbor	W. ¼ S	1½ do.
Round Island into Ha Ha Bay	N.E. ½ E.	1½ do.
This will leave all the islands to the starboard.		
La Boule Rock to Loon Islands	N.N.E. ¼ E.	3 do.
La Boule Rock to Goose Island	E.N.E.	5½ do.
Goose Island to Fox Island	N.E. by E.	6 do.

The *Great Island of Mecatina* being the most remarkable point of land about this part of the coast, from whence vessels frequently take their departure, and shape their courses to other places, the following table may be useful in showing the bearings and distances of the most remarkable points, rocks, headlands and harbors from it, allowing the variation to be 2 points westerly, which is sufficiently near the truth for any purpose of navigation.

From the Round Head of Mecatina to Mecatina Island	W. by N. ¼ N.	3½ miles.
——— to the outer rocks off the Islands of Entrance	S.W. ¾ S.	5 do.
——— to Murr Islands	S.S.W. ½ S.	5 nearly.
——— to Flat Island	S. by E.	5 miles.
——— to Loon Islands	N. ½ E.	4 do.
——— to Round Island, Ha Ha Bay	N.N.W. ½ N.	6½ do.
——— to Treble Hill Islands	E. ¾ S.	3½ do.
——— to Double Hill Islands	N.N.E.	5½ do.
——— to Goose Islands	N.E. ¾ N.	5½ do.
——— to Fox Islands	N.E. ½ E.	11 do.
——— to St. Augustine's Chain	E.N.E.	25 do.
——— to Shag Island	E.N.E.	31½ do.
——— to Shecatica	E.N.E.	41 do.

The land from the Grand Point of Mecatina runs about W. S. W. 15 leagues, to Cape Whittle, and is skirted by many islands and rocks, some of which lie 7 miles off shore; therefore, in coasting along, the land must always have a wide berth given to it; vessels entering the Strait of Belle Isle, and being abreast of Chateaux Point, distant 7 or 8 miles, or having brought the Red Cliffs to bear west, distant 5 or 6 miles, may steer a W. S. W. ½ W. course, and they will go clear of all dangers; when having passed the Southmaker's Ledge, which is the outermost reef, distant 7 miles from Cape Whittle, and brought that cape to bear N. by W. or N. distant 8 or more miles, they may steer W. by N. past Wolf Island, until they see Mount Joli*, a sandy ridge, on the main land; bring that to bear N. W. by N. and a N. W. ½ W. course will take them to St. Genevieve Island.

REMARKS.—All the islands along the coast of Labrador have a barren appearance, the outer ones being, for the most part, small low rocky islets, and the inner ones large and high, covered with a sort of green moss. There is no wood to be obtained, except at those places where we have mentioned.

TIDES.—The course and flowing of the tides along the whole coast are irregular and uncertain, depending much upon the prevailing winds; and when the weather has been settled, it was high water at Shecatica, full and change, about 11 o'clock, and at Mecatina at half after two. The rise of the tides being about 7 feet.

At Red Bay the tide flows full and change at half past nine o'clock; at Forteau Bay at eleven; at Labrador at half after eleven; and at all these places, spring tides rise 7 feet, neaps 4 feet.

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* This is a sandy ridge, with spruce trees, near the S. W. extremity of Natashquan Point. Between Musquarro and Natashquan, parallel to the shore, from 6 to 11 miles distant, there are sand banks, with from 24 to 40 fathoms water, abounding with codfish.

GENERAL DESCRIPTION OF THE ISLAND AND *BANKS OF NEWFOUNDLAND.

THE ISLAND OF NEWFOUNDLAND is situated on the eastern side, and directly in front of the Gulf and River St. Lawrence, its northern part being separated from the coast of Labrador by the Straits of Belle Isle; and its south-western extremity from Breton Island and Nova Scotia, by the great entrance into the gulf. Its length, from Cape Race to Cape Norman, is nearly five degrees and a half; and its breadth, from Cape Spear to Cape Anguille, about 5 degrees 13 miles; being very narrow at the northward, but becoming wide as you approach southerly: its extremes lie between the latitudes of 46° 40′ and 51° 40′, and the longitudes of 52° 25′ and 59° 23′ west. The whole circuit of the island is indented with inlets and bays, many of which are extensive, commodious, and well sheltered, where vessels ride in perfect security; into these bays and harbors numerous rivulets continually run, which, besides the fine purity of their water, afford abundance of trout and other fish. Most of their harbors have complete anchorages, with clear and good channels into them, so that they can be navigated at all times without the assistance of a pilot; they are frequently situated so near to one another, that, in many places, they form a succession of harbors, but they are not all inhabited; the towns and villages are in general to be found in the larger branches only, where the situation and soil are most convenient; the inhabitants, therefore, are not numerous, and the settlements but small.

The Great Bank of Newfoundland is to the eastward of the island, and extends from about the latitude of 42° north to 50° or upwards, but recent observations seem to prove that its southern extent does not exceed the parallel of 42° 50′ north; its form, like those of the other banks, is irregular, and not easily ascertained or defined; but about the latitude of 45°, its breadth, including the Jaquet and Whale Banks, is nearly 4 degrees; to the northward and southward it narrows almost to a point, and seems insensibly to drop into fathomless water. The Jaquet and Whale Banks may be fairly considered parts of the Great Bank, being only divided from it by channels of somewhat deeper water. The Jaquet lies to the eastward, and has 55 fathoms upon it; its edge is very steep; between it and the edge of the Great Bank are 112, 120, and 160 fathoms. The mariner, when entering upon the Great Bank, will change his soundings from 60 to 30, 37, 44, 45, and 60 fathoms; and as he advances towards the Whale Banks, he will have 55 and 60 fathoms; between the Great Bank and the Whale Bank are 72, 75, and 80 fathoms, and upon the Whale Bank 50, 45, 55, and 60 fathoms, being over which, you again drop into 100 and 200 fathoms, no ground. On the western side of the Great Bank, and to the southward of the Island of Newfoundland and Nova Scotia, a chain of banks extends almost two degrees from the land; these are called Green Bank, Banquereau, Sable Island Bank, &c.; all these have soundings over them of various depths, from 20 to 70 fathoms, admirably situated, in dark weather, to warn the mariner of his approach towards the land.

The Outer, or False Bank, called also the Flemish Cap. This is a patch of rising ground lying two degrees to the eastward of the edge of the Great Bank, in latitude 46° 50′ and longitude 45°; its length is supposed to be about 90 miles, and breadth 50 miles; on it are from 100 to 158 fathoms; between it and the eastern edge of the Great Bank is much deeper water, the bottom being very fine sand and ooze, which will hardly stick to the lead; as you enter upon the Great Bank you will have fine whitish sand, speckled black. These banks are frequently enveloped in most horrid fogs, which, from the middle of spring to December, have been known to last 8 and 10 days successively: at such times they are often so thick that you will not be able to see any object at ten fathoms distance; a continual drizzling rain is dropping from your sails and rigging, a general calm prevails, and sometimes attended with a considerable swell of the sea, so that you are constantly in fear of running foul of some vessel, or being drifted by the currents upon some danger, which, from a total inability of discovering, you will have great difficulty to avoid. Added to this, the currents which surround the Island of Newfoundland are frequently so violent and so irregular, sometimes driving towards the shores, and sometimes towards the sea, that the greatest caution will always be found necessary, while the known current coming from the northern regions, sweeps along the shores of Labrador, and in the spring detaches immense icebergs, which float to the southward, and become exceedingly dangerous, especially in foggy weather. Some of these masses will frequently be grounded in 40 and 50 fathoms water, and others will be met with further out to seaward, at the distance of 125 or 130 leagues from the land; fortunately these formida-

* E. & G. W. Blunt have published a CHART of the Bank and Coast of Newfoundland, Gut of Canso, and Gulf of St. Lawrence, from the Admiralty and French Surveys.

ble objects may generally be discovered, even in dark weather, by a white and bright appearance on the sky above them, and also by the roar of the waters breaking against them; they also may be apprehended by the intense coldness they diffuse to a great distance around them; they continue and are usually met with as late as June, July, and August. Your approach towards the banks may be known by the numerous sea fowls which will attend you, as roches, malimauks, and divers; these latter are seldom found more than 30 leagues off the banks. Malimauks and others are occasionally seen all across the Atlantic, but in the vicinity of the banks they become numerous.

The following directions are translated from the report of a recent survey of the Banks of Newfoundland by the French:

"The quality of the bottom varies greatly; but we will remark, that on the Great Bank of Newfoundland the bottom is generally of sand, or sand mixed with gravel; seldom of pebbles.

"The eastern approach is a fine white or whitish sand, often brilliant. In the deep places which separate the banks, and more particularly in the Whale's Hole, the muddy bottom which is found, has a fetid smell.

"The currents on the Great Bank of Newfoundland have a variable direction; the wind is not the sole cause of them; it is not rare for the current to be against the wind. We think that the tide has also some influence; for we have remarked, while at anchor, that the direction of the current varied as well as the velocity. Veracious fishermen have assured us, that the current daily made the round of the compass. However, we can say with a certainty which results from what we have seen and discovered during our navigation on these coasts, that most frequently beyond the meridian of Cape Race, the current runs to the westward; that to the north as well as to the south of the Great Bank of Newfoundland, and on the eastern approach, its direction varies little from E. S. E. to S. S. E., and most generally is between these points. The velocity, which is seldom below 8 or 10 miles in 24 hours, increases sometimes to 24 or 30 miles.

"We should inform navigators that on the outside approaches of all the banks, and principally on the southern approach of the Great Bank, the currents boil and form eddies in such a manner that a vessel becalmed, or with a light wind, cannot estimate their course with exactness.

"The courses on the parallels between 45° and 46° of latitude, are the best for crossing the Great Bank of Newfoundland, and arriving at Green Bank and St. Peter's Bank.—When these are reached, if you are bound to St. Peter's, in foggy weather, you must keep on the northern side of St. Peter's Bank, and wait a favorable opportunity of reaching land.

"By sounding frequently, the position of the vessel will be known well enough to arrive at the islands of St. Pierre and Miquelon."

THE VIRGIN or CAPE RACE ROCKS are extremely dangerous; they extend in an irregular chain or cluster S. W. by W. and N. E. by E. 800 yards, the breadth varying from 200 to 300 yards; the least water on a white rock is 4½ fathoms, with from 5 to 6½ fathoms, about one hundred yards all around it—the bottom distinctly visible. Towards the extremities of the shoal, the soundings are from 7 to 9 fathoms on detached rocks, with deep water between them, the current setting a mile an hour to the W. S. W. with a confused cross swell to the S. E.—South, S. W.—West, and W. N. W. of the shoal, the water deepens gradually to 30 fathoms, half a mile distant, to the N. W. North, and N. E. one-third of a mile, and to E. N. E.—East, and E. S. E. a mile.

The bank upon which the shoal is situated extends E. by N. and W. by S. 4 miles and a quarter; and 2¾ miles across its broadest part, with regular soundings of from 28 to 30 fathoms, until they suddenly deepen on its outer edge to 39 and 43 fathoms.

The bottom is seen, and large patches of sea-weed on the sand around them. Over them the sea breaks so violent as to make it unsafe to pass in a gale. Lat. 46° 26′ 15″ N. Long. 50° 57′ 30″ W.

EAST COAST OF NEWFOUNDLAND,

FROM CAPE RACE TO ST. JOHN'S HARBOR.

Variation 26° West.

CAPE RACE is the S. E. point of Newfoundland, and lies in 46° 39′ 44″ north latitude, and in 53° 05′ longitude west from Greenwich; it is table land, moderately high; near it is a black rock, and several smaller ones around it.

E. S. E. from Cape Race is a fishing bank, over which are from 17 to 25 fathoms water; it is named the New Bank, and is about 5 miles long and 2 miles broad.

From Cape Race to Cape Ballard the course is N. E. by E. distant 8½ miles. About one mile southward of Cape Ballard is Chain Cove Head, appearing high and dark; between the points is a cove, and to the westward of Chain Cove Head is Chain Cove, having a black rock above water lying before it.

RENOWES.—About three quarters of a league N. E. from Cape Ballard lie some small rocks, off Small Point, and 3½ miles beyond Small Point are the Renowes Rocks; they are moderately high and bold to, being distant from the land about one mile; 1¾ mile to the northward of these lies Renowes Island, situated near the main land; and about one mile to the southward of the entrance to Renowes Harbor, which is but an indifferent place of shelter, with a depth of water of 15 feet; to sail into it you must keep the north shore on board, for several rocks lie scattered about its entrance, and S. E. winds commonly send in a very rough sea.

FERMOSE.—Near 3 miles further north is Fermose or Fermouse Harbor, and between them is Bear's Cove, off which a sunken rock lies a cable's length from the shore. There is no danger in sailing into Fermose Harbor, though the entrance is narrow; just within it, on the northern side, is a small cove, where a fishery is carried on, but the anchorage is indifferent; further in is Admiral's Cove, where merchant vessels ride landlocked in 7 and 8 fathoms; and one mile within that is Vice Admiral's Cove; large ships anchor on its south side in 12 and 15 fathoms, muddy ground, and very convenient for both wood and water. On the same side, further in, is Sheep's Head Cove, directly off which, near the middle of the channel, is a bank with only 9 feet, constituting the only known danger within this harbor.

From Fermouse Harbor, about one mile N. E. by E. is Bald Head, N. by E. from which, one mile further, is Black Head.

AQUAFORT.—From Black Head to the entrance of Aquafort Harbor the course is N. by W. distant one mile, at the mouth of which is a rock above water; to the northward of this rock is the passage in, having 15 fathoms water; the harbor runs in W. N. W. about 3 miles, becoming narrow as you advance; here you have 4 fathoms water; within the narrows, on the northern shore, is a little cove, where vessels may heave down, the shore being steep. To sail up, give the stony beach on the north shore a berth, it being shoal, except at the point of the narrows, where it is bold to.

FERRYLAND HARBOR is to the northward, and its entrance is between Ferryland Head and Bois Island, being little more than half a cable's length wide. Ferryland Head has two rocks near it, called the Hare's Ears; when you have passed these and are within Bois Island, it becomes wider, having good anchorage with 8 and 10 fathoms, but northeast winds send in a heavy sea over the lower rocks, which run from Bois Island to the main.

From Bois Island to Goose Island the course is N. N. E. ¾ E. distant half a mile, and from Goose to Stone Island the course is N. N. E. ½ N. distant half a mile.

CAPLIN BAY.—Two and a half miles from Goose Island is Caplin Bay, running in N. W. by N.; there is a passage into it, on either side of Goose Island; to the northward of Goose, and between it and Stone Island, there is no danger, the islands being bold to; but in passing between it and the Island of Bois, take care to keep the point of Ferryland Head open to the eastward of Bois, by which means you will avoid a sunken rock having only 2 fathoms water over it; this rock lies nearly midway between Goose Island and Cold East Point, and having passed this rock no other danger will be found in sailing up the bay to the best anchorage, which is abreast of a cove on the larboard shore, and half a mile within Scogin's Head, with 16 fathoms water.

From Ferryland Head to Cape Broyle, the course is nearly N. N. E. distant 2¾ miles. Cape Broyle is high land, making somewhat in the form of a saddle. South of the north part of the cape ¾ of a mile, lies the Old Harry Rock, over which are only 3 fathoms water, though between the main and it are 20 fathoms. E. N. E. of the cape, distant ¾ of a mile, are the Horse Rocks, having from 7 to 14 fathoms over them: the mark for these rocks is a white house on Ferryland Downs open with Stone Islands; and the head of Cape Broyle Harbor open will lead directly upon them. In stormy weather the sea breaks very high over them

CAPE BROYLE HARBOR runs in about 4 miles, between Cape Broyle and Brigus Head, their distance from each other being 1½ mile. Within the entrance, on the north side, is Admiral's Cove, where you may anchor in 12 fathoms water, good ground, but exposed to the S. E. The best anchorage will be found above the Narrows, in 7 fathoms: the only danger in the way is the Saturday's Ledge, which lies about 1½ cable's length outside of the Narrows, on the north shore: bring the saddle of Brigus Head open of the point of Admiral's Cove, and you will clear it; and after you get beyond the Narrows anchor in 7 fathoms, good ground, very convenient for both wood and water.

BRIGUS.—This is a small cove, or harbor, a little to the northward of Brigus Head; but it is only fit for boats.

Four and a half miles from Cape Broyle is Cape Neddick, a kind of table land moderately elevated, and steep to. From Cape Neddick to Baline Head is 1½ mile; one-quar-

ter of a mile to the northward of this is Baline Cove, fit only for boats. The outer part of Great Island is about 2½ miles N. E. by E. ½ E. from Cape Neddick; and from Baline Head to Spear Island, the course is N. N. E. ½ E. distant one mile. Within this island is a fishery, but the anchorage is unsafe, and the bottom rocky. One mile to the northward is Toad's Cove, fit only for boats; half a mile from which is Tinker's Point, the southern boundary of Momables Bay; this place is nearly one mile deep; it is open, and its northern point forms the southern part of Witless Bay; about three-quarters of a mile from which is Green Island; and the same distance to the northward of Green Island, is Gull Island, about a mile in length, and a quarter of a mile in breadth, the land appearing high.

WHITTLE BAY extends inwards full two miles from Gull Island, but lies open to the sea; the ground is tolerably good, and the depth of water moderate; but half way up is a ledge of rocks off the northern shore, part of which are seen at half tide.

BAY OF BULLS.—One mile and a quarter to the northward of Gull Island is the southern point of the Bay of Bulls, and from hence to the northern point, called Bull Head, the course is E. N. E. ½ E. distant one mile and a quarter; between these points the bay runs up N. W. by W. nearly two miles, and then N. W. by N. one mile further to the river head. Within this bay the riding is good, in from 20 to 16 fathoms; and after you have passed Bread and Cheese Point there is a cove; off this latter point lies a sunken rock, at the distance of about half a cable's length, having passed which, the bay is free from danger, and the shores bold: run up and anchor over against John Clay's Hill, bringing it to bear N. E. by N. having 12, 13, and 14 fathoms; the merchant vessels run further in to 10 and 7 fathoms.

From Cape Broyle to the Bay of Bulls, the course is N. E. by N. distant 4½ leagues. From Bull's Head to the south point of Little or Petty Harbor, from which a reef of rocks stretches out about a quarter of a mile, the course is N. E. distant 8¼ miles. The south point of Petty Harbor is distant from the north point 2½ miles, between which lies the bay, running in two miles; at the bottom of this is a cove and fishery. About midway between the Bay of Bulls and Little Bay, is a cavern, having an opening at its summit, through which, whenever the sea runs high, the water spouts through, forming a remarkable appearance, which may be seen far off: it is therefore significantly enough named the Spout.

From the North, or Lady Point of Little Harbor, Cape Spear bears N. E. distant 2¼ miles; it has a low and ragged appearance, and is the easternmost part of Newfoundland, and lies in latitude 47° 30′ 53″ N. and in longitude 52° 39′ 20″ W. Vessels from the eastward, upon getting into soundings, and bound for St. John's, generally steer for this point. Between the cape and the entrance to St. John's, are three bays; the first is called Cape Bay, and lies between Cape Spear and Black Head; the second is called Deadman's Bay, and lies between Black Head and Small Point; and the third is called Freshwater Bay, and lies between Small Point and Fort Amherst.

There is a light-house on Cape Spear, containing a revolving light, elevated 275 feet above the level of the sea. The times of light and darkness are equal.

ST. JOHN'S HARBOR is one of the principal places in Newfoundland, being the seat of government; and although its entrance is narrow, its harbor is excellent, and its situation readily known, both by the Blockhouse built on Signal Hill, at the north side, and Fort Amherst, on which there is a fixed light on its south head or point of entrance. The channel, from point to point, is only 360 fathoms wide; but it gets wider just within the points than between them, decreasing again as you approach the Chain Rock, for from the latter to the Pancake Rock, the distance is only 95 fathoms, these are rocks, both being above water, and steep to; Chain is the northern rock, and Pancake Rock lies on the south side of the channel.

In approaching the Harbor of St. John's with a large ship, care must be taken to avoid the Vestal Rock, which lies about 50 fathoms off the southern, or Fort Amherst Point; over this rock are 25 feet water; the marks for it are Fort William, or the Old Garrison, just open of the south head; and the outer Wash Ball Rock open to the eastward of the Cuckold's Head; these latter rocks lie close to the northern point of the harbor, and are always above water, being steep to, and therefore not dangerous. The course is N. W. by W. the shores continuing bold until you get near the Pancake, then give the south side a small berth, continue the same course, or rather more inclined to the westward, keeping Fort Amherst Flagstaff open to the northward of Frederick's Battery Flagstaff; you will by these means avoid the Prosser, a rock on the larboard side, running off the end of another rock, formed like a saddle, with 18 feet water in the hollow, and only 5 feet on its outside; yet it is steep to, having not less than 5 fathoms close to it; so soon as you are within, and have passed the Prosser Rocks, you may steer up as you please, both shores being clear of dangers, and anchor in from 4 to 10 fathoms water, on a bottom of mud, and lying quite land-locked.

The winds from the S. W. to the southward, as far as N. E. by E. blow in, all other directions of the wind either baffle or blow out of the Narrows; with the latter winds you

must warp in, for the convenience of doing which, rings are fixed in the rocks on each side: the anchorage within the Narrows has from 10 to 16 fathoms, and a little before you enter the Narrows there are 20 fathoms.

The tides rise 6, 7, and 8 feet, but very irregular, being much influenced by the winds.

FROM ST. JOHN'S HARBOR TO BACCALOU ISLAND.

We recommend the mariner to be careful, lest, if a stranger to the coast, he should mistake Kitty Vitty, a small place fit only for boats, lying about one mile to the northward of St. John's, for St. John's itself; at a distance it has the appearance of a good harbor; he will therefore observe, that at Kitty Vitty's south side is a round hill, shaped like a haycock, standing upon Cuckold's Head; while St. John's Harbor may be distinguished by Fort Amherst, which appears white; and by the Flag-staves on the hill, over the north point of entrance; these will sufficiently denote the right entrance.

About one mile from Cuckold's Point, is a small point or projection of the land; and two miles further is Sugar Loaf Point, tapering upward, and much resembling a sugar loaf. One league further is Red Head; between Sugar Loaf Point and which is Logy Bay.

TORBAY.—One mile and a half from Red Head is the south point of Torbay, which is somewhat lower than the others. From this Point to Green Cove, the customary place where vessels anchor, the course is W. N. W. about two miles, where you may ride in 14 and 12 fathoms, but it is much exposed to seaward. This bay is large, being full a league in extent; from off its northern point is a flat rock, where the sea breaks; a heavy swell sets from the eastward into the bay, so that it is not a good place to lie in.

From Flat Rock Point, which is low dark land, the coast runs northerly to Red Head, a distance of two miles; and from thence to Black Head, N. E. by E. two miles more; the latter bearing north, distant 6½ miles from Torbay South Point.

CAPE ST. FRANCIS.—From Black Head to Cape St. Francis the course is N. N. W. distant one league. Cape St. Francis has a white appearance, and is itself low, but above it the land rises high. A little south of the Cape is Shoe Cove, a place used in bad weather for splitting and salting fish. Off the Cove there is good fishing, and with northerly, westerly, and southerly winds you will lie safe within the cove.

About one mile and a half east of the cape lie the Brandy Rocks, in triangular position, the outermost being distant from the cape 1¾ mile: the sea breaks over them: and there is a channel between them and the cape, but too dangerous to be attempted; these rocks considerably add to the safety of Shoe Cove.

There is also another small cove, fit for boats, to the northward of the cape, which may be used with the wind off shore.

CONCEPTION BAY.—Cape St. Francis, which we have already described, is the southern point of Conception Bay. From Cape St. Francis to the southern point of Baccalou Island, which may be considered the other point or boundary of Conception Bay, the course and distance is N. N. E. ½ N. 5⅔ leagues; this is an extensive and deep bay, running to the south-westward, and comprehending many lesser bays and inlets.

BELLE ISLE.—Four leagues S. W. by W. from Cape St. Francis is Belle Isle, in length 5½ miles, in breadth about two; this island is lofty, and its eastern side is near three miles off the main; there is on this side, a beach, to the southward of which is good anchorage, in 30 fathoms, sandy ground; and a league further, near the south part of the island, is also tolerable anchorage in from 15 to 30 fathoms. At the south end of the island is a small cove, called Lance Cove, which fishing vessels sometimes resort to, and find good shelter for five or six vessels. One mile from the south part of the island lies a rock, over which are 2½ fathoms water. Two miles S. by W. from Lance Cove, lies a small low island, called Little Belle Isle, W. S. W. of which, distant 1½ mile, is Kelley's Island, of middling height, and about three quarters of a mile in length.

Within Belle Isle, on the main, is Portugal Cove, the anchorage within which is not considered safe. To the southward is Broad Cove, and at the bottom of the bay is Hollyrood Harbor, in depth about 3½ miles; in a cove, on the west side of which is good anchorage in 8, 9, 10 or 12 fathoms water, and room enough to moor.

Following the coast, about 1½ mile from Hollyrood entrance, is Harbor Main, about 1½ mile in depth, and half a mile wide; it is an open place, but near the upper part you may anchor in from 7 to 10 fathoms water.

SALMON COVE.—One mile further is Salmon Cove, the entrance to which is a mile wide; the course in is W. S.W. about 2½ miles; it then divides into two branches, one to the westward about one mile, the other southward one mile and a half; in either of these branches the anchorage is good, but the southern river is considered the better one, there being no danger in entering. In the western branch a rock lies at a small distance from the starboard shore, having on either side a passage, but the southern one is the wider of the two.

COLLIER'S BAY.—To the northward near one league, lies Collier's Bay, running inward south-westerly full two leagues; one mile and a half from the entrance of which

lies a sunken rock, nearly mid-channel, on both sides of which the channel is good; this rock is visible at three quarters ebb. Two and a half miles up the bay is good anchorage in 10 fathoms water, on the eastern side, and opposite a small cove; into this cove vessels may go, and ride in 3 and 4 fathoms water. Higher up the bay is another cove, at the further distance of 1½ mile, but it is both foul and shallow. Near the head of the bay the anchorage is good in 8, 9, and 10 fathoms.

BRIGUS BAY is two miles to the northward of Collier's Bay, and seldom frequented but by small vessels, it being open, and too far up Conception Bay: it runs in from Brigus Head about 1½ mile, and has anchorage in from 10 to 15 fathoms; or at the head of the bay, behind a small island, on the south side, small craft may lie secure from all winds, with 3 and 4 fathoms water, and moor to the shores. The south point of Brigus Bay may be known by its peculiar ragged appearance.

PORTGRAVE, or PORT DE GRAVE, BAY lies to the northward of Brigus, and has within it Sheep's and Cupid's Coves; the latter is on the south side of the bay, and is a good place for 2 or 3 ships to ride in, with 4, 5, and 6 fathoms water, almost land-locked, and having not above one point open; its north side is bold, and you may lie alongside the rocks and take in your cargoes; the shore on the northern side is remarkably high, and called Spectacle Head. Sheeps, or Ship Cove, will accommodate small vessels in 4 and 5 fathoms water, mooring head and stern, having their S. W. anchor in 22 fathoms about a cable and a quarter's length from the ship.

Portgrave is about three quarters of a mile to the westward of Ship Cove; the water within the islands is shallow, but without them the anchorage is 20 and 25 fathoms deep, where you will be quite exposed to south-easterly winds. Burnt Head is the south point of Portgrave Bay; from whence 2½ miles N. E. ¼ N. lies Bay Roberts Point, the southern point of the entrance to Robert's Bay, which is 1½ mile broad, and runs in to the south-westward 5 miles. One mile above Bay Roberts Point is Blow-me-down Head, which is higher than any land near it; half a mile within this is a cove.

BAY ROBERTS has no invisible danger at its entrance; you may borrow on either side or go close to the island, which lies further in on your starboard side; having passed which, you may run on about a mile, and lie land-locked in 9 or 10 fathoms; between the island and main vessels can anchor, but the ground is foul and bad; and there are two sunken rocks, one being near the inner part of the island, the other above the island and near the main. Two miles above the island is excellent anchorage, in the N. W. arm or branch of the bay, on muddy ground; give the south point a good berth in sailing in, as some rocks under water lie near it, and the starboard shore shoals near half a cable's length.

SPANIARD'S BAY is divided from Bay Roberts by an isthmus, or neck of land; this Bay is deep and extensive, but open to the S. Easterly winds; there is anchorage within it, nearly all over, especially at its head, in 7 and 8 fathoms water.

Two leagues N. E. from Spaniard's Bay are the islands of Harbor Grace, they are distant from Cape St. Francis about 6 leagues, bearing E. ¼ S. To the southward is Bryant's Cove, a good place for fish, but not for shipping; there is a rock midway of the entrance; you may sail in on either side of this rock, and find good anchorage in 4 and 5 fathoms water. The ground within the rock is clean.

HARBOR GRACE.—The entrance to the harbor is to the northward of the islands, for to the southward, and between them and the shore, the channel is narrow and the ground is foul; the course in will be nearly west: almost mid-channel is the Salvage Rock, no danger is outside of this rock; there is also another rock, called the Long Harry, lying near the north shore; both these rocks are above water, and always visible. When you are within the Salvage, go no nearer the west shore than just to open a passage on the west side of the Long Harry, the leading mark for sailing in being the high point of the main, called Mosquito Point, just open to the eastward of Long Harry Rock; this will carry you in with not less than 22 fathoms, quite up to the harbor, clear of all danger; but toward the eastern shore, you may stand over until you bring the Western Landmark on with the Cupola of the Chapel; you will then be up to the north side of the bar, and must take care not to open these marks, especially if the mark in the Cove at Ship's Head is open with the mark on the point of Admiral's Beach; but if you can bring the Western Landmark at the back of the Chapel on with the Cupola, before the mark at the Cove at Ship's Head comes on with the mark at the point of Admiral's Beach, then you will be in the narrows, and must not stand further over to the eastward than to bring those marks in one, and continue turning with these marks to the east and west, until you bring the Eastern Landmark at the back of the Chapel on with the Cupola, then you will be within the bar, and should stand well over to the eastward. About half way down this harbor a broad spit of sand runs off from the southern shore, extending full two thirds over towards the Chapel; this appears to be what Mr. Lane has called the bar, it has 1½, 2, 3 and 3½ fathoms in some places over it; but there is a channel between it and the northern shore, with 4 and 5 fathoms water; to sail through which bring Otterbury Head on with the point of the beach at Ship's Head, this will also lead to the northward of the isl-

and of the Harbor Grace. A white rock on the beach at the west end of Father Ewer's House, near the Catholic Chapel, will clear the east end of the spit; the western post of the said Father Ewer's Gate on with the opening between the Spire and the west end of the Catholic Chapel, will clear the west end of the spit; and the outer edge of the Long Harry on with the extreme point of the northern shore, will clear the shoal on its northern side. This is a very good and convenient anchorage, with room enough for a vessel to turn in or out of the narrows; and the marks here given are very easily to be distinguished, and will clear all dangers. The Middle Mark at the back of the Chapel on with the Cupola, and the mark at Ship's Head on with that at Admiral's Beach, leads on to the shoalest part of the bar. To the northward of Harbor Grace is Carbonierre Island and Harbor; before you reach which is Mosquito Cove, a place between Harbor Grace and Carbonierre, little frequented, although the anchorage is good, it not being convenient for the fisheries.

CARBONIERRE ISLAND lies about 18 miles from Cape St. Francis, its southern end is low land, but upon it stands a small fort, built for the defence of the fishermen. The island is bold to, so are the shores of the harbor, but off the S. W. end of the island are several rocks under water: the passage therefore, between the island and the main, should not be attempted. On the north side, opposite Carbonierre Island, are two small coves, where the planters live, who keep fishing boats; the northern of these is called Clown's Cove, fit only for boats; the other is called Crocker's Cove, and is separated only from Carbonierre Bay by a small point of land, named Crocker's Point. Off these coves are several rocks, both above and under water; therefore, in sailing either in or out of the Bay of Carbonierre, these must have a berth; and after you reach Otterbury Point you may stand in to either shore, both being bold to, until you near the head of the harbor: this is a good place for riding in. It is wide, and with water of various depths for anchoring every where.

Two miles N. E. by N. from Carbonierre Island is Salmon Cove Head, high and steep; behind which is a cove, where abundance of salmon are caught; an island lies in the midway of the channel, but the cove is only fit for boats.

GREEN BAY.—Four or five miles further north is Broad Cove Head; and 3½ miles further is Green or Western Bay Point; off the shore, and about a mile to the northward of Broad Cove, is anchorage in from 10 to 15 fathoms. At the entrance to Green Bay, is anchorage in 15 and 16 fathoms, but it would be dangerous to go far into the Bay, which is quite open to the eastward.

Five miles to the north-eastward of Green Bay is Devil's Point Cove, a place of little note, and further on is Flamborough Head, black and steep to; there is no good place of shelter hereabout, nor from Carbonierre to the Island Bacalieu, except with the wind off shore.

BAY VERDE is about half a mile to the westward of the head, and up to the cove is three quarters of a mile; the entrance is not above a cable's length across, and vessels lie about half a cable's length from the head of the bay, in 5 fathoms water, having a cable fastened to the shore, and an anchor out astern; six or seven ships can lie in this manner, but S. W. winds blowing right in, would make that a dangerous situation; it is also a bad place for either wood or water, but the great quantities of fish which resort here, occasion it to be much frequented. It is a place easily known by Bacalieu and the projecting land, called Split Point; Bay Verde Head itself will serve to point out its position, for these three heads, Bay Verde Head, Split Point and Bacalieu Island, appear prominent bluff land, very similar to one another, as you come from the southward; and there is no hidden danger in entering the bay. The Island Bacalieu is high land, nearly 4 miles long and 1½ broad, it is distant 1½ mile from the main, and between is a good channel; nearly midway between its southern point and Split Point is a sunken rock, over which, in blowing weather, the sea generally breaks, although it is six fathoms under water, and steep to all round.

From Split Point about 4½ miles is the Point of Grates, having rounded which, you will open Trinity Bay.

FROM BACALIEU, OR BACCALOU, ISLAND TO CAPE BONAVISTA.

TRINITY BAY is, like Conception Bay, wide, extensive, and forms itself south-westward; like that also, it contains many lesser bays and harbors within it; these will be regularly described in rotation. Point Grates is the S. Eastern point of the Bay; from which, distant about 2 miles, is Break-heart Point, and between them is a kind of Bay, where boats, with an off-shore wind, ride in safety; within this bay is a ledge of rocks above water. To the southward of Break-heart Point is Scurvy Island, and between this island and Sherwick Point is a bay running in S. S. E. about three quarters of a mile; the course from Break-heart Point to Sherwick Point is S. W. by W. 3 miles. Off the latter is a rock above water; this forms the northern point of Old Perlican; vessels cannot go between the island and point, although the passage appears good and open, because the ground is altogether foul and rocky, always therefore run in to the southward of the island, and

when you have passed it, anchor in 4 or 5 fathoms; this cannot be considered a good harbor, as the ground is bad for holding, and with the wind at N. W. you will then be obliged to buoy your cables. From Old Perlican to Salvage Point the course is W. ½ N. distant 5 miles; Salvage Point requires a good berth, having a reef of rocks running out from it, the point itself is low. From Salvage Point to Hants Head the course is W. by S. distant 7 miles; and one mile to the eastward of the Head is Hants Harbor, fit for small craft only; two miles off which is Hants Harbor Rock, over which the sea generally breaks; bring King's Head open of the Sugar Loaf, and you will clear it to the northward. Two miles further is King's Head, and from King's Head to the Sugar Loaf the course and distance is S. W. ½ W. about 3 miles.

Eastward of the Sugar Loaf is Sillee Cove, fit only for boats, and unsafe for vessels.

NEW PERLICAN.—From the Sugar Loaf to the north point of the entrance of New Perlican, the bearing is S. W. ¼ W. distant 2 miles; and one mile further is the harbor, small, but tolerably good, within which you may ride land-locked in from 5 to 10 fathoms; the shores are bold to, and free from danger; the entrance is nearly two miles wide, being bounded by Smutty Nose Point on the east, and Gorlob Point on the west; but as you advance the harbor becomes narrower, so that at the anchorage it will scarcely be half a mile broad.

HEART'S CONTENT.—Three miles from New Perlican is Heart's Content, a good harbor, fit for any ship, with excellent anchorage towards the north shore, in from 8 to 12 fathoms water. One league further is Heart's Desire, fit for boats only; and 3½ miles beyond that is Heart's Delight, another cove, adapted for small craft only. From Heart's Delight, about three miles, is Long Point, projecting considerably into the bay, and a league further is Witless Bay, by no means a place of safety, being too much exposed, and the bottom rocky; between Long Point and Witless Bay are two small islands, which you leave on your larboard side.

One mile from Witless Bay is Green Harbor, where vessels may anchor in from 7 to 10 fathoms; three miles further is Hope-all-a-head; two miles beyond which is New Harbor, a place of shoal water, and only fit for boats.

DILDO HARBOR.—Two and a half miles from New Harbor is Dildo Harbor, within which is very good anchorage, in a cove, at the northern side of the entrance, in from 10 to 20 fathoms water, good clean ground. Three miles from thence is Chapel Bay, the mouth of which is a mile broad, and the bay about three miles deep; here, behind a small island, about two miles in, is good anchorage in from 8 to 12 fathoms. About 5 miles to the northward is Collier's Bay, very similar and running nearly in the same direction to Chapel Bay; seven miles further is the Point of Tickle Harbor Bay, which runs inward, in a southerly direction, full 8 miles; there is no danger in the way, and though little frequented, the anchorage is safe.

BAY OF BULLS.—To the northward is the Bay of Bulls, running in a N. N. Westerly direction to within 2 miles of Chance River, in Placentia Bay; there is very good anchorage in various parts of this bay, in 12 and 10 fathoms water, particularly on the western side in a cove, about one mile and a half from the entrance, with from 10 to 15 fathoms, sandy ground; to the N. E. is Bull Island, and 5 miles further Copper Island; both these lie very near the shore: we now open Deer Harbor, a place extensive, and good for anchorage, but barred with many shoals; the first shoal lies midway between Tickle Point and Deer Island, having 6 fathoms on its shallowest part, and therefore not dangerous; but one third of a mile further in, is a bank with only 2 and 2½ fathoms water; bring the point of the N. E. cove open of Shallop Cove Point, and you will go clear to the westward in 7 fathoms water. There is also another shoal lying off the point on the outside of Shallop Cove, on which are 2½ fathoms; this will be avoided by just opening the point of Deer Island with the first point on the main, within Deer Island; and after you have passed Harbor Island, you may anchor on good ground, in from 10 to 26 fathoms. The entrance of Deer Harbor bears from the north point of Bacalieu Island, W. ½ S. distant about 13 leagues.

Full 2½ miles N. E. from the entrance to Deer Harbor is Jones's Harbor, the mouth of which is not above a quarter of a mile wide, and the channel in is, in several parts, still less; it runs in 2½ or 3 miles, and has good anchorage in from 5 to 24 fathoms water. To the southward is a high and steep island, called Jones Island; about 4 miles from which is Bald Head; and 2 miles further Ganny Cove; its entrance is confined, being not more than a quarter of a mile wide; there is, nevertheless, good riding within it, in 10, 12, and 15 fathoms; about a cable's length off the north shore, just at the entrance, lies a sunken rock, and about a mile S. S. E. from the south point of Long Island, is another rock, by some called White Island, just appearing above water; this rock bears S. W. from Random South Head.

Random North Head lies W. by N. distant 9½ leagues from the north end of Bacalieu Island, and about 4½ leagues N. by W. from New Perlican.

RANDOM SOUND lies to the westward, and comprehends several arms and harbors: thus Random and Smith's Sounds unite and form Random Island, the channels being

narrow, long, and curcuitous; at the junction of the two sounds is a small island with a bar of only two fathoms water, the passage being not a mile broad. About 3 leagues from Random North Head, lies Hickman's Harbor, where you will find good anchorage in 15 fathoms. Random North Head bears from Random South Head N. E. ½ E. distant 3 miles. When you are within the entrance of Random Sound there is a branch runs in toward the south-west; about 1 mile within which is Fox Cove, fit for boats, and 2 miles further Little Heart's Ease, a similar cove, running in a quarter of a mile, then dividing into 2 branches; the western one has 4 and 5 fathoms within it, but the eastern branch is shallow and adapted for boats only. There is also an anchorage 2 miles further, on the same side, in a cove with an island before it, with 8 fathoms; and not far from this is another cove on the northern side, where a vessel may ride in 7 fathoms.

SMITH SOUND has generally deep water, and is, in most places, one mile wide, until you get near the head. Shut-in Harbor is on the starboard side; it is nearly at the entrance, and has no safe anchorage, the ground being rocky; 3 miles further up is Pope's Harbor; this also is encumbered with rocks, a shoal lying near the middle of it. The direction of the channel is westward about 7½ leagues. To the eastward of Random Island are Duck and Green Islands, both lying a considerable distance from the main; the latter is high, and may be seen as far as Trinity Harbor; it bears from Bonaventure Head S. W. ¼ S. distant about 6 miles; and Bonaventure Head bears from the entrance of Smith's Sound E. N. E. ½ E. distant 5 miles. To the north-westward of Green Island is Anthony Island and Ireland's Eye; the latter is 3½ miles in length, and lies in a S. W. and N. E. direction, making the larboard side of the entrance to Smith's Sound. The northern point of Ireland's Eye bears from Bonaventure Head nearly S. W. distant 5½ miles.

There is a small place of anchorage, called Ryder's Harbor, formed by a little island near the main, and bearing from Green Island S. E. ¼ E. distant 4 miles; the passage to it is round the west end of the point, off which are some scattered rocks, both above and under water; within this harbor are 3 fathoms water, and about a quarter of a mile from Ryder's Island the N. W. arm branches off, running westward one mile, and being about a quarter of a mile wide; here are 7 fathoms and good anchorage. From Bonaventure Head to Port Bonaventure is 2 miles; but when you are a mile off, and to the southward of the Head, the harbor to the Admiral's Stage will lie about N. by W.

PORT BONAVENTURE'S best entrance is between two small islands; but you may go on either side of them in 3 and 4 fathoms water: with a leading wind there will be little danger; and when you are within, and have passed these islands, anchor in 4 and 5 fathoms; southerly winds here send in a very heavy sea; there is, however, a secure place for boats within a point behind the Admiral's Stage, appearing like a great pond, where 100 boats may lie, even with bad weather, in safety.

From Bacalieu North Point to Bonaventure Head the course and distance is N. W. ¼ W. 22½ miles. Bonaventure Head is remarkably high and steep.

From Bonaventure Head to the entrance of Trinity Harbor, the course and distance is N. E. ½ N. 4¾ miles; and from Bonaventure Head to the Horsechops E. N. E. ½ E. 8 miles.

TRINITY HARBOR is considered one of the best and largest harbors in all Newfoundland, having several arms and coves, where some hundred ships may ride land-locked. It is a place which you may safely turn in or out, being bold to on each side, and having no danger but what is visible, except when going into the S. W. arm; where the Admiral's Stage usually is, there is a shoal, called the Muscle Bank, from which shoots off the point within the small island on the larboard side going in, and extends over N. N. W. about a third of the breadth of that arm. Being within that bank, which will discover itself by the color of the water, you may edge over close to the south shore, or keep your lead going to avoid the Muscle Bank, giving it a little distance; the mark for avoiding it is the house, standing over the steep perpendicular rock, situated between Tavernor's Point and Ship Cove, open of the Neddick; keep this mark on until you are half way over to the Neddick, then haul toward the S. W. branch, taking care to avoid the south shore till you shut in Tavernor's Point with the Neddick; you will then go within the Muscle Bank. You may anchor in from 14 to 10 fathoms, and approach near to the stage on shore, so as to make a stage with topmasts to your stage on shore, to load or unload your ship. This will be found a most excellent harbor; for, after you are in the S. W. arm, you will perceive another branch running up to the N. W. which is continued by another to the S. W.; but there is a bar or ledge, at the entrance of the S. W. arm. The N. W. arm is also a large place, having good anchorage for 500 sail of ships. Besides the fore-mentioned arms, the main harbor turns up to the north.

Ships, being within the harbor's mouth, may safely ride in a large cove on the starboard or east side, land-locked, on good ground; here the planters live. Over against that cove, on the larboard or west side, are two other coves; the southernmost of them is called the Vice Admiral's Cove, very convenient for curing fish; and above, or to the northward of that, is a large cove or arm, called Got's Cove, where there is room enough

for 300 or 400 sail of ships to ride, all on clear ground; there neither winds nor sea nor tide can hurt you; and in this place ships may lie undiscovered until the weather becomes clear and open.

There are several other anchoring places in this harbor, with good clean ground. The bottom every where is tough clay, with 4 and 5 fathoms water, within two boats' length of the shore; and 6, 7, 8, 9, 10, 12, and 14 fathoms; and in some places more, in the middle of the arms and channels. You may turn in or out readily, observing your tide, which rises about 4 feet, and sometimes more.

ROBINHOOD'S BAY.—Sherwick Head, which is the eastern point of Trinity Harbor, forms also the south-western boundary of Robinhood's Bay, the entrance to which is a mile wide, and the bay extends northward nearly two miles; here vessels frequently ride and fish, in from 7 to 17 fathoms water; at the further or upper end of this bay there are some spots of shallow water, but at its entrance, and between Sherwick and Fox Island Points there is no danger whatever.

SALMON COVE and ENGLISH HARBOR lie to the eastward of Robinhood's Bay, being only divided from it by a narrow neck of land, called Fox's Island. The former of these runs in northerly, and is considered a good fishing place; it is clear of dangers, and has a good depth of water, from 17 to 10 and 8 fathoms; the eastern shore is bold to, and at the further end of the cove there is a small run of water, which extends about two miles to the northward.

ENGLISH HARBOR is situated at the south-eastern entrance of Salmon Cove; it is a clean bay, where you may ride in 4 and 5 fathoms water. From hence the coast rounds to the eastward to the Horsechops, a distance of more than three miles; it is all high land, steep to and without danger. To the north-eastward of Horsechops is Green Bay, open and entirely exposed to the southward; at the eastern part of this bay is a small sandy beach with a rivulet of water; this place is little frequented, and is neither convenient for ships to fish or ride in. When you have passed this bay there is no sheltering cove or place until you reach Ragged and Catalina Harbors.

RAGGED HARBOR is so named from the rough and craggy appearance of the surrounding rocks, which render it unsafe for either boats or ships to enter; but for those who intend going there, we shall observe, they must go to the northward of the reef of rocks at its entrance, running on north, until the harbor comes quite open, then you may steer in between the Round Island near the main, and a large black rock, being the outermost of the ragged ones before mentioned; sail on until you are to the westward of them all, or until you get the south head of Catalina to appear between the westernmost rock and the main, then anchor. A river of good water is at the head of the harbor.

CATALINA HARBOR is nearly two miles to the northward of Ragged Harbor, and is in the latitude of 48° 31′ 15″ N. bearing from the north point of Bacalieu Island nearly north, distant 24 miles. It is a good harbor for small vessels, and may be known by a singular green island at the south points of its entrance; near half a mile to the north of this island is the Brandy Rocks, a ledge over which the sea frequently breaks; you may go on either side of these rocks, giving the little island a berth, or with a leading wind between the island and the main, though this passage is exceeding narrow, in 4 and 5 fathoms. Just within the entrance of the harbor is Charlton Rock or shoal, lying nearly mid-channel, over which are only 8 feet water; you must avoid bringing the north point of Green Island on with Burnt Head, the south point of the harbor, for that will carry you right upon the rock; there is a passage between the island and rock, and also between the rock and the north shore, only steering nearer the main about two-thirds over.

LITTLE CATALINA BAY lies inwards on the northern side. From Catalina Harbor to Little Catalina, the course is about N. E. 1½ mile; and thence to the north head of the Bay E. N. E. a little easterly 4½ miles; when within the harbor you may anchor close to the shore in 4 and 5 fathoms, land-locked; or to the southward of the Little Green Island in 3½ fathoms, or by running up two miles further obtain fresh water. In the S. W. arm or branch of the river, where there is anchorage in 5 fathoms, the harbor runs westerly. Sometimes the water in this harbor will suddenly rise 3 or 4 feet, then fall again, and in certain seasons it will often do so 2 or 3 times in 3 or 4 hours. It abounds with salmon, and the herb Alexander grows luxuriantly on the Little Island; near a small cove, at the N. W. is a sort of mineral, of a glittering nature, generally called Fire Stone; excellent willicks way be found on the rocks.

From the south to the north head of Catalina the course is N. E. ¾ E. distant 5½ miles, and between them are from 13 to 5 fathoms water; the whole way is a kind of broken ground, and in blowing weather the sea frequently breaks high over it.

From the north head of Catalina to Flower's Point, the course is N. N. E. ¼ E. distant 2⅓ miles; and one mile to the eastward of the point lie some sunken rocks; you may go between Flower's Point and these rocks in 6 fathoms water, but it is more advisable to pass on the outside of them; this you will readily do by bringing Gull Island open of Spiller's Point, or by keeping the south head of Catalina open of the north head.

From Flower's Point to Bird's Island is 2 miles; within Bird's Island is a small bay where ships can occasionally ride, in one branch which runs up towards the west, and in the other, amidst some rocks, which are above water. Bird's Island Bay extends so far as Cape L'Argent.

From Flower's Point to Cape L'Argent is $3\frac{3}{4}$ miles; it is rather a low rocky point, having also a large rock above water lying off it.

From Cape L'Argent to Spiller's Point is $1\frac{1}{2}$ mile; between these points the lead falls into very deep water. Spiller's Point is steep and bold to, but not very high, with a rock above water near it; over the point, you may discern the high land of Port Bonavista a great way off at sea.

From Spiller's Point to Cape Bonavista the course is north, distant almost one league; between them is a deep bay, which might be mistaken for the Harbor of Bonavista, from the head of which it is only divided by a neck of land; two miles over, and from Red Head Bay, it is not above a musket shot.

Hitherto the allowance made for the variation of the compass has been two points west; which, it is presumed, will be found sufficiently near to the truth for all the purposes of navigation; but from hence to the northward it appears to have generally increased. At the Capes which form Bonavista Bay, the variation in 1820 was 30° 28′ W.; at Barrow Harbor 28° 30′ W.; and at Happy Adventure only 28°.

FROM CAPE BONAVISTA TO CAPE FREELS (NORTH.*)

CAPE BONAVISTA is in latitude 48° 42′ N. and longitude 52° 59′ 20″ W. The cape appears from a distance of a bluish color, and is a steep rocky point, having 4 fathoms close to the shore. Somewhat less than three quarters of a mile N. N. E. from the extremity of the cape lies Gull Island; which, though small, may easily be recognized, by being of moderate height, and elevated in the middle, making something like a round hat with broad green brims, and visible 4 or 5 leagues off, when the weather is clear; N. N. E. $\frac{1}{2}$ E. distant $3\frac{1}{2}$ miles from Gull Island, is the Old Harry Rock, having only 13 feet water over it; from this a reef or bank extends to the N. E. nearly three miles, having several dangerous spots upon it, of only 18 feet and 3 or 4 fathoms; the outer edge of this danger is called the Young Harry, and lies in latitude 48° 10′ N. and longitude 52° 58′ 15″ W.; at its northern extremity are 10 fathoms water, and a little farther off 45 fathoms; between the Young Harry and the middle ground of 18 feet, are 12, 20, and 50 fathoms; to the northward of the middle ground are 60 and 40 fathoms; to the eastward are 19 and 20 fathoms; to the southward, and between it and the Old Harry, 26 and 31 fathoms; at the north part of the Old Harry are 11 fathoms; to the westward 30 fathoms; to the S. W. 9 fathoms; and a little further S. W. 57 fathoms: abundance of fish are caught by the boats which frequent this bank, but it is very dangerous for shipping. The sea commonly breaks over O d Harry, unless in fine weather, and the water be very smooth; but the other part of the shoals show themselves only in, or immediately after, heavy gales on the shore.

In order to avoid the Old Harry, you should bring Gull Island on with the Green Ridge, which lies considerably inland; but you must beware, for this mark will carry you too close to the Young Harry. Vessels running along shore, to avoid these rocks, must be careful in keeping Cape Bonavista open with the westernmost extremity of a high range of land to the southward, called the Inner Ridge; these dangers, together with the long ledge, called the Flowers, already noticed, render it very imprudent for a mariner to attempt making land hereabout in thick or boisterous weather; indeed, at any time, the Island of Bacalieu is the best and safest landfall for the stranger that is bound to any part of Bonavista Bay.

BONAVISTA BAY.—This extensive bay is formed on the south by Cape Bonavista, and on the north by Cape Freels; these capes lie N. $\frac{3}{4}$ E. and S. $\frac{3}{4}$ W. from each other, and comprehend a distance of 40 miles, between which the coast is much indented with bays and inlets of the sea, most of which are navigable, but difficult, rocky, and dangerous. The land, on the south, is generally high and mountainous, and the shores steep and iron-bound; the north side is low and marshy, from which the water runs off shoal to a considerable distance; the whole bay abounds with small islands, and is on every side encompassed with dangers. The harbors, sounds, and inlets, are deep, extensive, numerous, well sheltered, and safe; but they are generally so deeply embayed, the passages into them so intricate, and the surrounding land so similar in appearance, that few, except those to whom the navigation is familiar, ever attempt to enter them. Of those which seem to offer the best refuge to strangers, who from necessity should be compelled to seek a place of shelter, the following appear best calculated to suit his circumstances: Barrow Harbor, or Great Chance Harbor, on the south; and New Harbor, or Cat Cove,

* So called to distinguish it from a cape of the same name, situated on the southern part of Newfoundland, near St. Mary's Bay.

on the north side of the bay; but the extreme narrowness of the entrance to New Harbor is a great impediment, and renders Cat Cove the most to be preferred.

PORT BONAVISTA, or Bonavista Harbor, lies within and about 3¾ miles to the south-eastward of Cape Bonavista, and vessels intending to rendezvous there, may either pass to it between Gull Island and the cape, or between Gull Island and the Old Harry Rock, or to the northward of the Young Harry altogether; if the former, between Gull Island and Bonavista, the passage is about three-quarters of a mile wide, and both the cape and island steep to, having 4 fathoms water close to eeach side, and 16 or 18 fathoms mid-channel; but it will be advisable not to go too near to the Gull Island, on account of a rock under water, which lies about 300 yards off the S. E. part of the island. Having passed through this channel, and finding yourself to the westward of the cape, you will see Green Island, distant about half a mile from the cape; large vessels commonly leave this island on their larboard side, in their passage to Port Bonavista, going between Green and Stone Islands; the channel is full one mile and a quarter wide, and with 12, 16, and 18 fathoms water in it, and no danger whatever, except a sunk rock of 3 fathoms water, which lies about 200 yards to the N. E. of Green Island: or they may go to the westward of Stone Island, and run on southerly until they open the points of the harbor, and having passed Moses Point, sail to the southward of the Swerry's Rocks; these are always visible, and have no passage between them and the point: here they may anchor in 10 or 8 fathoms.

The inner passage, between Cape Bonavista and Green Island, is frequently attempted by small vessels; the channel is in some parts narrow, and the ground foul: about a mile to the south-eastward of the Green Island is the ledge of red rocks; you may go between these and the land into Red Cove; there are 6 fathoms water, and in the cove 4½, 4, and 3 fathoms; but the ground is all foul: there is a passage also to the southward of these rocks, and between them and Western Head, in which are 6 fathoms. A little to the eastward of Western Head there is a small rock under water; it lies about a cable's length from the shore, and the sea commonly breaks over it, but boats can go between it and the shore. To the southward is Red Head or Point, and further on is Moses Point; between these is another opening, called Bayley's Cove; you may, in case of extreme necessity, run in here and anchor, but the ground is foul and rocky throughout; there was on the north side of this cove a stage for fishing. Moses Point is the northern point of Bonavista Bay; this place is a very eligible situation for carrying on the fishery, but it is so open to the weather, that with north-westerly gales, following a continuance of strong winds from seaward, the waves break right athwart the harbor's mouth, and sometimes the whole of the fishing boats founder at their anchors, and not unfrequently many of their stages are destroyed. Vessels during the summer months commonly moor under Swerry Head in 8 or 10 fathoms; but even here, and in every other part of this harbor, the ground is so rocky and uneven, that you will be obliged to buoy up your cable.

BLACK HEAD BAY.—This is a wide and deep bay, comprehended between Black Head to the eastward and Southern Head to the westward. Black Head bears from Cape Bonavista W. S. W. ½ S. distant 5¾ miles; Southern Head bears from Cape Bonavista W. ¾ N. distant 12 miles; and Black Head and Southern Head bear from each other E. S. E. ¾ S. and W. N. W. ¾ N. being nearly 8 miles apart. On the western side of Black Head Bay is King's Cove, distant about 4 miles from Southern Head; this also is a fishing establishment, but still more objectionable, as a place of shelter, than Bonavista, for this is directly open to seaward, and the ground is all foul.

KEELS.—This is another establishment for the fisheries, and situated in one of the coves about midway between Southern and Western Heads; between these two heads are four other coves, but neither Keels nor any of these coves are fit or good places for anchorage, especially with ships of burthen.

From Western Head the land bends W. S. W. ½ S. and leads to numerous coves, bays, and arms of the sea, most of which have deep water, and places of anchorage; we shall here enumerate the principal of these, with their respective situations; but, as many of them are too deeply embayed for general navigation, we shall not extend our directions to a minute or particular description of them all, but confine ourselves to such only as are situated in prominent parts of the bay, and are mostly fitted for general use, and commonly frequented.

We have already stated, that from Western Head the land turns W. S. Westward, and leads to Plate Cove, Indian Arm, and Southward Bay.

PLATE COVE is situated on the coast about 7½ miles distant from Western Head; its entrance between Arrow Point and Plate Cove Head is three-quarters of a mile wide, from whence it bends in more than a mile to the southward; at its eastern extremity is a run of fresh water, but the bottom is foul and rocky; it is therefore not much frequented.

INDIAN ARM lies about S. W. by W. from Plate Cove Head, distant 3 miles; it is a narrow inlet running in nearly S. W. about two miles, and terminates in a rivulet of fresh water.

SOUTHWARD BAY is separated from Indian Arm only by a narrow neck of land; this is an extensive branch of the sea; its entrance, between Red Head and Kate's Harbor Head, is a full mile wide, with 30, 50, 80, and 90 fathoms water, mid-channel; from hence it bends to the south-westward 7½ miles, becoming narrower as you advance, but with deep water and no danger. On the western side there is an opening, called Hayes Cove; it lies about 2 miles from Kate Harbor Head.

BACON-BONE ROCK.—It will be proper here to remark, that vessels intending to seek either of these places, must beware of the Bacon-Bone Rock, a danger of only 18 feet water over it: this lies W. ½ N. distant one mile from Western Head, and directly in the fairway of the navigation. To avoid this danger, do not shut in Southern Head until Little Denier comes on with the outer Shag Island.

KATE HARBOR lies to the westward of Plate Cove; its entrance is three-quarters of a mile wide, and the harbor runs in about one mile and a quarter; the depth of water is 36, 29, and 27 fathoms mid-channel, decreasing as you advance to the further end: there is a rock under water off its entrance with 7, 8, and 9 fathoms round it; this lies nearer to Kate's Head, but there is a passage between them, and also a still wider channel on the western side of the rock.

SWEET BAY.—This is another extensive inlet, lying to the westward of Kate Harbor; its entrance is between Cutler's Head and Chance Point, and leads also to Maidenhair Cove, and Little and Great Chance Harbors. Sweet Bay is the easternmost inlet, which having entered, and passed Cutler's Head, which is rocky and steep to, you will see Turfpook Island; it is small and narrow: about half a mile to the S. W. of this is Woody Island, and between them a rock under water; there is a passage on either side of these, and when you get beyond Woody Island, the bay becomes about three-quarters of a mile wide, with 60 fathoms water, mid-way: advancing still further you will observe several islands in your passage: there is also a rock under water on your starboard side, three-quarters of a mile beyond Woody Island; it lies abreast of a little island which is mid-channel: further on is Wolf Island, between which and the main there is no passage; off this lies Gooseberry Island, between which and Wolf Island there are 30 fathoms water, but the channel is narrow, and that on the eastern side of Gooseberry Island is much wider. Sweet Bay here divides into two branches; that to the eastward is called the south-west arm, and has directly before its entrance Hunt's Island, the channel to the eastward of which has 10, 12, and 14 fathoms water, and that to the westward 7 and 9 fathoms; you will then see on your starboard side a small island; you may pass it on either side, and having so done, will drop into 24, 22, and 20 fathoms water: the head of the arm is foul and rocky. The N. W. arm is divided from the S. W. arm a little below Hunt's Island, and at the further end of Wolf's Island is nearly a mile wide, from whence it runs south-westerly 3¼ miles, with good depth of water, and clear of dangers; at the bottom is a sandy beach and a small rivulet.

GREAT CHANCE HARBOR.—This is an excellent and convenient place of anchorage, the entrance to which lies W. ¾ S. distant 10½ miles from Western Head. Vessels sailing for this place should recollect the mark already given to avoid the Bacon-Bone Rock; having passed this danger, you may sail on directly for the harbor; the course will be W. ½ N. until you get abreast of Chance Point; you will now guard against a sunken rock at the southern part of the entrance, which has only 16 feet water over it; to avoid and go clear of this danger, be careful not to shut in the westward Mustard-bowl Island with the eastern one; these are situated at the larboard side of the channel: having passed the eastern island, stand boldly in, approaching each side as nearly as you like, and anchor any where above the narrows in from 11 to 5 fathoms; the ground is good and holds well: you will lie sheltered from all weather, and may procure wood and water with great facility. Chance Point and Cutler's Head are both steep to; off the former, and directly in a line between the southern part of Long Islands, there is a spot of ground with only 7 fathoms water; during heavy gales from the seaward this will show itself by the sea breaking over it, but in fine weather it is not dangerous. N. E. a little northerly, distant almost one mile, is the Chance Gull Rock, steep to, and always visible: to the westward is Deer Island, one mile and a quarter long, but narrow; there is a good channel between it and the main to Chandler's Reach.

CHANDLER'S REACH is the channel leading to Goose Bay and Clode Sound; the course through which is W. ½ S. which, from the N. W. point of Deer Island, will take you to Connecting Point; this is the point of the peninsula that divides the former from the latter.

GOOSE BAY runs in south-westerly about 7½ miles, and by keeping in mid-channel you will meet with no danger, but have 47, 40, and 36 fathoms water, until, having passed Lubber's Hole, the depth decreases to 12, 13, 10, and 8 fathoms, when you will see a small island situated to the westward of Goose Head; behind, and to the westward of this, you may anchor in from 4 to 7 fathoms, or further to the southward in 5½ fathoms: in most of these inlets you will lie perfectly safe, and entirely land-locked; fresh water and wood are plentiful, and easily obtained.

CLODE SOUND is a fine branch of the sea, running in from Chandler's Reach full 20 miles; it has many good places of very good anchorage, and without any danger: vessels may find perfect safety on the northern shore, at Brown's Cove, or further in, at Long Cove, or Platter Cove; or on the southern shore, at Bunyan's and Love Coves; or, passing the Platter Rocks, and steering westward, at Freshwater Cove; the mid-channel has all the way deep water, and there are no rocks except near the shores.

LION'S DEN.—This is an opening lying at the N. W. end of Chandler's Reach; to enter which you must sail to the northward of the Deer and Cluster Islands, and pass the narrows, which is about one-third of a mile wide, and has 24 fathoms water in it; having passed the entrance about one mile, there is a sunken rock, round which are 4, 5, and 6 fathoms; you may then perceive the inlet to branch off into two divisions; that to the N. W. is very narrow, and has a rocky islet at its entrance; but that which runs to the S. W. is broader, and has 11, 14, and 10 fathoms water in it; it runs in from the sunken rock about 1¾ mile, and at its further end becomes shoal, narrow, and rocky.

THE LONG ISLANDS are 4 in number, having narrow channels between them, some of which are encumbered with rocks, and dangerous; the eastern island is the largest and broadest; the next to it is the longest; the two western ones are smaller and narrower; they form the northern boundary of the passage from Western Head to Chandler's Reach; and also the southern boundary to Swale Tickle and Newman's Sound. Off the north-eastern point of the largest Long Island lies a sunken rock; it is close to the land, and therefore may easily be avoided: this point bears from Western Head nearly W. by N., distant 6 miles.

NEWMAN'S SOUND.—This is a large arm of the sea, running in W. by N., having at its entrance Swale Island, which is nearly 4½ miles long, and not one broad in the widest part. This divides the entrance into two channels; the southern passage is called the Swale Tickle, and the northern one goes by the general name of Newman's Sound. To sail from abreast of the Western Head into the Swale Tickle, you must steer W. N. W. ½ W. To sail from abreast of the Bonavista Gull Island, steer W. N. W. ¾ W. 29 miles, and it will carry you a little to the southward of Little Swale Island, and in the fairway of the passage: but in advancing through this channel there are several obstructions, and the passages from thence into Newman's Sound are so narrow, that it will always be advisable to go to the northward of the Great Swale Island. To do this, having rounded the Gull Island, steer W. N. W. ½ W. 27 or 28 miles; you will then have the sound open, and can proceed accordingly. It is full 1¼ mile wide, and extends in nearly a N. by W. direction from the N. E. point of Swale Island 11 miles, having several places of good anchorage. Those on the southern shore are South Broad Cove, Minchin's Cove, and Stanford Cove.

SOUTH BROAD COVE is situated two miles and a half beyond the western point of Swale Island, and is a place of great safety; the passage in is to the south-westward, and you will ride well sheltered in 10 fathoms, free from any danger: there is a small island at the entrance, which you will leave on your larboard side.

MINCHIN'S COVE is to the westward; to go to this place, there is a long narrow point of land running out to the northward, which you will round, and turning southerly, the cove will appear open: here you will lie in 5 fathoms, opposite a sandy beach. To the westward is Mount Stanford, off the point of which lies a small island, reaching half way over the passage, making the channel in this part very narrow; the best course through is to the eastward of this island, in 9 fathoms; here an opening appears to the eastward, called Buckley's Cove, fit for small vessels: the coast now winding to the westward forms a broad bay, with 20, 26, and 27 fathoms water in it, free from any danger, and shallowing on each side towards the shores. At the south-western part of this is Stanford Cove, having a sandy beach, the approach towards which shallows gradually.

The anchorages on the northern shore are, North Broad Cove, Great and Little Happy Adventure Coves, and Barrow Harbors; Barrow Harbor is tolerably safe, and the most convenient harbor on the south side of Bonavista Bay; it is situated on the southern side of the peninsula which divides Newman's Sound from Salvage Bay, and is formed by three large islands, Keat's, Goodwin's and Richard's Islands; that part between Goodwin's Island and the main is the entrance, about 500 yards wide, and not difficult of access. The harbor is a full mile in length, the outer part is rocky and not well sheltered, but the inner part is completely land-locked, and has good holding ground. Vessels taking their departure from Gull Island, Bonavista, should steer N. W. by W. ¾ W. about 22 miles. But if coming from the northward, their course from the Eastern Goosberry Rock, towards Barrow Harbor, will be S. W. ¼ W. 18 miles; Goosberry Rock appears just above water. In this course they will have to avoid the Malone Rock and Ledge, the latter being a shoal, lying S. ¾ W. distant one mile from the rock, which is always above water: this shoal has never less than 4 fathoms over it, so that, in fine weather, no danger whatever is to be apprehended. In sailing on, and approaching Little Denier Island, which is almost opposite the harbor's mouth, you must be particularly careful of the Outer Rock, lying N. ¾ W. of Denier, distant three quarters of a mile; this has only 4

and 6 feet upon it, but fortunately the sea constantly breaks over it, thereby pointing out its situation, and enabling the mariner to guard against, and steer clear of the danger. Having reached the Little Denier, it will be better to go on its northern side, for between Little Denier and Richard's Island there lies a dangerous reef of rocks, called the Brandishes; these extend nearly in a line, but at various distances, almost half way over the channel; upon these rocks are from 12 to 17 feet, with narrow channels of 7 and 8 fathoms between them; to navigate this passage, therefore, requires a pilot. To clear the Brandishes, you should keep Wedge Point a little open to the southward of Smoky Ridge, which is a range of high lands at the top of the harbor, until you bring Broom Head on with the Middle Shag Island; the passage then will be open, and without obstruction, until you get near to Wedge Point; off which, only 70 yards, lies a sunken rock, with 8 feet water; you may then sail up Pudner's Cove, until you are entirely shut in from the sea; then you can anchor in from 10 to 18 fathoms. Some vessels prefer anchoring in Garland's Creek, but without running well up, the ground is foul. The land about Barrow Harbors is higher than the neighboring shores, and, consequently, may be the more readily recognized by its projection.

SANDY COVE lies further up Newman's Sound, and has good anchorage; it may readily be known, having the only sandy beach on the north side of the sound; there is no danger in entering, and it is perfectly safe, the depth of water being from 10 to 20 fathoms. In sailing to this place, and keeping along the northern shore, between Barrow Harbor and Sandy Cove, you will meet with a rocky islet, called the Half-way Rock; it is steep to, and has 4 fathoms close to it; there is also a deep water channel between it and the main, but keep outside, and pass to the southward of it, and there will be no danger.

GREAT AND LITTLE ADVENTURE COVES.—These are two snug little coves, lying about three quarters of a mile above Sandy Cove, and on the same side of Newman's Sound; but from the narrowness of their entrances they are fit only for small vessels. Between these coves, and off a point of land which separates them, lies a sunken rock, about 80 yards from the shore, with only 4 feet over it. Off the entrance to Great Adventure Cove, lies Sidney Island; the passage in is to the northward of this island, for between the island and Harbor Head, there is no thoroughfare.

NORTH BROAD COVE.—The entrance to this place lies one mile and three quarters from Harbor Head, and is on the northern shore; it is a convenient and well sheltered anchorage, and may be easily known by a round island lying at its western side; this is named Black Duck Island. Sailing into the Cove you should keep the island on board until you make a tickle* between it and the western shore, to avoid a sunken rock at its eastern side; after which, it is advisable to keep as close as possible to the eastern shore, for there is a dangerous rock lying mid-channel; being inside this rock, you may anchor in from 10 to 25 fathoms, muddy ground.

In advancing further up Newman's Sound, there are some other dangerous rocks, lying off the northern shore; one of these is called the Shag Rock, and lies three quarters of a mile beyond Black Duck Islet; and one mile further on is Hall's Rock; both these are under water, and distant about a cable's length from the land; they have 4 and 5 fathoms close to them, and a passage between them and the shore of 6 and 7 fathoms; therefore, in sailing up Newman's Sound, the northern shore should always have a good berth. Keep nearly half a mile off, and you will avoid them all.

SALVAGE BAY lies on the northern side of the promontory which divides it from Newman's Sound; it has several runs of fresh water within it, but no place of good shelter.

DAMNABLE HARBOR lies to the northward of Salvage Bay; between them are several small islands and rocks, the largest of these is named the Baker's Loaf, and is a narrow island, about three quarters of a mile long. To go to this place from Gull Island, Bonavista, you should steer W. N. W. $\frac{3}{4}$ N. about 7 leagues, and round the Shag Islands; proceed thence to the northward of the Baker's Loaf, or steer N. W. by W. from the Gull towards the Ship Island, which may readily be known by a remarkable bald point, like a sugar loaf; then W. $\frac{1}{2}$ S. from Ship Island, $5\frac{1}{2}$ miles, will bring you to the entrance of Damnable Harbor; this place is well adapted for the reception of small vessels, but its very narrow entrance disqualifies it for ships of burden. There is a rock off the southern part of the entrance, and another off the northern side of the island, which lies in the middle of the harbor; there is good anchorage all round the island in 4 and 5 fathoms, sandy bottom.

MORRIS'S COVE.—This lies on the north side of Morris's Island, and is considered to be a safe anchorage. In sailing for this place, keep Ship Island well on board, on account of a dangerous reef, which extends from Flat Island nearly two thirds of the way towards Ship Island, on some parts of which there are not above 17 or 18 feet: proceed therefore to the northward of Ship Island, passing at not more than half a mile distance;

* "Tickle," a narrow passage between islands and rocks.

and when you are well inside, avoid shutting in Lackington Rock with Varket Island; this latter will be known by its appearing like two singular hummocks, on account of there being several clusters of rocks between Ship and Horsechop Islands; steer for Varket until you get abreast of Lackington Rock, then keep Lackington Rock on the northern extremity of Ship Island, until the Varket bears north, in order to clear the two sunken rocks off the end of Morris Island; you may then steer directly for the Cove, which you can enter without fearing obstruction, and anchor in any part thereof, in 25 to 5 fathoms; but the western side of the Cove is to be preferred.

BAY OF FAIR AND FALSE.—This place may contain several good anchorages, but it is so filled with small islands and rocks, that no description we could give would be of any use to the mariner. A cluster of large islands extends off the frontage of this bay, full 20 miles, or so far as Offer Gooseberry Island; between these are passages innumerable, with deep water; there is also a wide chanel, running from Fair and False Bay, and Morris Island, to the northward; this leads to Bloody Bay, which then turns westward, and is divided into various branches, forming the N. W. arm, the middle arm, and the north-east arm; this latter being a peculiar and extensive channel, running in one direction, southward, almost to Newman's Sound; and in another, almost to Damnable Harbor: all these are navigable, and afford places of good anchorage, and plenty of both wood and water. There is also an open strait from Bloody Bay to the eastward; through Bloody and Cottel's Reaches, and out to the northward of Offer Gooseberry Island. Other channels branch off to the northward from Bloody and Cottel's Reaches, and between the Lakeman's Islands, running into Pit's Sound, Locker's and Content Reaches; and thence to Freshwater Bay: within these, and on the northern shore, are Hare, Locker's, Trinity, Indian, and many other lesser bays, coves, and inlets, abounding with good anchorages, and calculated to afford shelter for shipping of all descriptions, in cases of necessity: these are, at present, but little known, and frequented only by the constant traders; we shall, therefore, proceed to those which are the usual places of resort, and are better situated for the purpose of fishing.

Vessels coming from the south-eastward, and bound to the northward, for New Harbor, Greenspond Tickle, Cat Cove, the N. W. arm, or anchorages adjacent, frequently take their departure from Cape Bonavista; in which case, their course will be N. by W. to clear the Eastern Rock, which lies E. S. E., distant one mile and a quarter from Offer Gooseberry Island. From thence they should steer N. $\frac{3}{4}$ E. to Copper Island, at the mouth of Greenspond Tickle; here pilots may frequently be obtained to conduct you to this, or any of the adjoining anchorages; there is good holding ground between Greenspond Island and the main; but the water is generally so deep that a vessel is liable to be drifted on shore in the act of weighing; nor is there sufficient room to veer out a lengthened cable in heavy gales from the S. W., to which quarter it is much exposed.

Ships coming from the eastward, or round Cape Freels, must be careful to go clear of the Charge Rock, which lies S. E. $\frac{3}{4}$ S. two and a half miles from Gull Island off Cape Freels; this has only 6 feet water over it, and is circumscribed by a large spot of rough fishing ground, with from 8 to 30 fathoms upon it. From the Gull Island of Cape Freels you may run immediately for the Stinking Islands, taking care not to open Cape Freels to the eastward of the former; this will carry you inside the danger. You should keep a good look-out for the mid-rocks, which appear just above water, and lie two miles N. E. by E. $\frac{1}{4}$ E. from the Stinking Islands; but vessels not bound up the bay, are strictly recommended to keep outside of them all; for, should the weather become suddenly thick and foggy, a circumstance by no means unusual, more especially with an easterly wind, you will run great hazard of getting bewildered among the innumerable rocks, which are scattered so profusely about this part of the coast; and from which neither compass nor chart can extricate you. In the winter months, when the north-easterly gales are generally heavy and continuous, the sea breaks exceedingly high over several spots of the Stinking Banks, which lie E. by N. $\frac{1}{2}$ N. from the islands, distant about $2\frac{1}{2}$ miles; in two places there are only 7 fathoms over these banks: and in such weather, although a ship would not strike, she would be in great danger of foundering in the tremendous sea which would then frequently break over her; but when the weather is settled, and the sea smooth, they are by no means dangerous.

Having rounded the Stinking Islands, and wishing to sail into New Harbor, or Cat Cove, you may, with propriety, steer S. W. by W $\frac{1}{4}$ W. directly for the Offer Gooseberry Island, until you bring Pouch and Flower Islands to touch each other; you will then be two miles outside of the three rocks, which lie $1\frac{1}{2}$ mile to the southward of Flower Island; the outer rock has 3 fathoms over it, the middle rock 14 feet, and the inner rock only 11 feet. You will now alter your course to W. $\frac{1}{4}$ S., keeping the white face of Chalky Hills a little on the starboard bow, which will take you clear of Copper Island dangers; then, should the inclemency of the weather prevent your getting a pilot on board, you can continue this course until you bring Shoe Cove Point, which may be distinguished by its semblance to white marble, to bear N. W. $\frac{1}{2}$ W., then shape your course W. N. W. for Indian Bay.

NEW HARBOR is situated on the eastern side of Indian Bay, about two miles from the Shoe Cove Point; this place, during easterly winds, will be quite inaccessible, on account of its narrow entrance; in this case, you must proceed onward, about four miles, for Cat Cove.

CAT COVE.—In order to reach this place, you will proceed between Silver Hair and Brown Fox Islands and the main; and as you approach the latter the channel narrows, and you will have a narrow island on your starboard side; this is Cat Island, behind which is Cat Cove; you will have no difficulty in distinguishing this island, it being the only part that is covered with LIVE WOODS, for the surrounding forests have all been destroyed by some general conflagration. Off the upper part of Cat Island lie two high green rocks; you must go round these, for the water is too shoal to go between them: having done so, you may run on until you get some distance inside the upper point of the island, when you may anchor in from 5 to 13 fathoms, with a hawse open to the N. W., the winds from that quarter being most heavy and squally. In working in, you may stand close to either shore, except off the point of the island, as there is a sunken rock within 100 yards of it, with not more than 10 feet water over it.

NORTH-WEST ARM.—This is situated on the main, and is the place of safety nearest to Cape Freels; but its entrance is very difficult, on account of the number of islands that surround it, and these islands are almost undistinguishable one from the other, from their similarity of appearance. In coming from the southward for the North-west Arm, the greatest danger which you will have to encounter is the Northern Rock, which never has less than 22 feet over it; this lies N. E., distant one mile and three-quarters from the Copper Island; this island you will easily recognize by its having no wood upon it, and by its height. In fine weather, and a smooth sea, vessels pass over it in perfect safety; but in hard gales, the waves beat over it incredibly high. To avoid it, be careful to open Fool's Island, which is somewhat higher, and more prominent than the rest, and which is covered with trees, except about the summit, to the westward of the Western Pond Rock, until you get Butterfly Island to touch the inner part of Flower Island, or until Puffin and Copper Islands touch each other; then, leaving the Pond Rocks on your starboard side, steer in for Fool's Island; it is advisable to keep this island well on board, for there is a sunken rock, lying mid-channel, exactly between it and Partridge Island Rocks: this danger has only 18 feet water over it; but no mark can be given to avoid this rock. The course then up the arm will be N. W. ¼ W.; and so soon as you get inside of Odd Island, you may anchor on muddy ground, in from 7 to 9 fathoms, Fool's Island Hill bearing S. E. to S. E. by S.

GREENSPOND TICKLE.—Greenspond is a square island, about a mile in breadth each way. A reef of rocky islets runs off its southern part all the way to Puffin Island. Greenspond Tickle lies on the south-eastern part of the island, and is of very little importance, being incapable of receiving any vessel whose draught of water exceeds 14 feet: the dangers in going to this place, are the Northern Rock, the Cook-room and Harbor Rocks; but it will be almost impossible to get into this harbor with an adverse wind, or even with a fair one, without the assistance of a pilot.

Ships sometimes run in, and anchor between Greenspond Island and the main, but the channel is narrow, the water is very deep, and it lies too open to the S. W. winds to be considered a place of safety. In order to sail into it you must get to the westward of the Copper Islands; in so doing, be careful of the Midsummer Rock, which lies nearly W. by S. ¼ S., distant one mile from Copper Island, and has only 5 and 6 feet over it. Observe, when you shut in Silver Hare Island by Shoe Cove Point, you will be within side of the danger; it is also necessary to give Newal's and Ship Island a wide berth, as the water shoals off them to a considerable distance.

CAPE FREELS TO THE STRAIT OF BELLE ISLE.

CAPE FREELS is formed of three points, the South Bill, the North Bill, and the Middle, or Cape Freels: there are many shoals and rocky dangers about them all, therefore a wide berth should be given them at all times. Over these points is some high land, commonly called the Cape Ridge, which is visible at a considerable distance.

FUNK ISLAND.—N. 54° E. from Cape Freels, distant 27 miles, lies the Funk Island. This is little more than a sterile rock, and cannot be seen further than at the distance of 10 or 12 miles; but it will always be distinguished by the great number of birds which continually hover over it. About 200 yards north of Funk Island is a large rock above water, and N. W. by W. 180 yards from this are still larger rocks; they are all barren, and only the resort of sea birds, that inhabit and breed there; between these rocks are 18, 37, and 42 fathoms water, with a clear passage; but between the eastern rock and Funk Island there is a dangerous sunken rock, of only 10 feet water, over which the sea generally breaks: near this sunken rock are 14 and 16 fathoms, and between it and Funk Island, 30, 25, 56, 38, 24, and 17 fathoms; off the western point of Funk Island are some rocks, and at its eastern part a sort of creek with 5 fathoms in it. It is also reported that a ledge of rocks lies S. W. from Funk Island, distant about 7 miles.

DUREL'S LEDGE, *or Snap Rock.*—This is a dangerous reef, and said to lie about 7 leagues N. W. by N. from Funk Island; the sea breaks over it continually; and nearly N. W. by W., distant 3 leagues from Durel's Ledge, is another danger, named Cromwell's Ledge; it is supposed to bear E.S.E. $\frac{3}{4}$ E., distant 10 or 16 miles from Little Fogo Islands.

N. N. W. $\frac{1}{2}$ W. from Cape Freels, distant $6\frac{1}{4}$ miles, is the Outer Cat Island; it is connected to the main by a sandy reef, which is impassable for shipping, and forms the southern point of Deadman's Bay; a little before you come to the Outer Cat, you will see a remarkable hill, called the Windmill Hill, and near it the Little Cat Island. In sailing to or from Cape Freels the shore should have a good berth, although there are soundings all the way, and they decrease gradually towards the shore. Deadman's Bay is formed by the Outer Cat Island to the southward, and Deadman's Point to the northward; the soundings within it are regular, and the bay without rocks, unless close to the shore; but it is totally unsheltered and open to all easterly winds.

Having passed Deadman's Point, you will approach the Penguin Islands; these are 2 in number, and bear from Cape Freels N. N. W. $\frac{1}{4}$ W., distant 14 and 15 miles; between them the passage is clear, with from $5\frac{1}{2}$ to 7 fathoms water; but vessels should not go within them and the shore, for there are several rocky reefs, which render it particularly dangerous.

RAGGED HARBOR lies to the north-westward of the Penguins, distant $6\frac{1}{2}$ miles; the main land hereabout is low and sandy, and the passage from the eastward rocky and dangerous; it should therefore not be attempted by a stranger, or without a pilot. To the north-westward is Ladle Cove Island, and 7 miles beyond that is Rocky Bay. At its entrance, which is wide, lie three islands, Noggin Island, Green Island, and further south is White Island; you may pass between each of these in 7 fathoms; between Rocky Point and Green Island in 7, 8, 13, or 10 fathoms; and between Green and White Islands in 13 and 14 fathoms; between Noggin Island and the western point of the bay there are $3\frac{1}{2}$, 7, 12, 9, and 4 fathoms; the bottom of these bays, for there are 3 openings, is rocky, and vessels cannot go far into them.

THE WADHAM ISLANDS.—These are a cluster of islands lying to the north-westward of Cape Freels. They consist of 8 or 10 scattered islands, separated from each other by channels more than 1 and 2 miles wide; the largest of these is called Peckford's Island, which is almost a mile long, lies in the direction of north and south, and bears from Cape Freels nearly N. by W., distant 20 miles; from its southern part, towards the land about Ragged Harbor, there are a number of rocky islets and reefs, with channels between them, rendering the navigation of this part extremely hazardous. N. N. W. $\frac{1}{2}$ N. $1\frac{1}{2}$ mile from Peckford's Island is White Island, but a passage between them should not be attempted, for there are several small rocks lying off the north and north-western part of Peckford's Island, some of which stretch out almost as far as White Island. N. W. by W. from Peckford's Island, about $4\frac{1}{4}$ miles, is Copper Island; Green Island lies W. N. W. $\frac{1}{4}$ N. $2\frac{1}{2}$ miles from Peckford's Island, and about a similar distance S. S. E. $\frac{1}{2}$ E. from Copper Island; there are also some small rocks lying off the N. W. end of Green Island, which being visible, can always be avoided with ease.

S. W. ROCK.—This is a small detached rock above water, bearing from Peckford's Island S. S. E. $\frac{1}{4}$ E., distant $3\frac{1}{4}$ miles; near it are 13, 17, and 21 fathoms; about N. N. E., distant 2 miles from the S. W. Rock, is a small flat island; and a little more to the eastward is Offer Island; this is the most easterly of all the Wadham Islands. There is yet a rock to describe, which lies E. S. E. $\frac{1}{4}$ E. from Offer Island, distant about one mile and a half; this is dangerous, and must have a berth in passing either north or south of it.

THE FOGO ISLANDS lie to the north-westward of the Wadham Islands; Great Fogo is a large island, 4 leagues long and 9 miles broad; off its south-western point lie the Indian Islands; and N. E. by N. 4 miles from the body of Great Fogo are the Little Fogo Islands; numerous other rocks and small islands are scattered about.

SHOAL BAY.—This harbor is very secure, with good anchorage in any part above the Harbor Rock: it has two tickles, so called in Newfoundland, and intended to describe narrow passages between islands and rocks; these may be entered with any wind except from the south to the S. W., which wind blows out of both. To enter the Eastern Tickle, you should borrow on Rags Island, keeping the extreme of Fogo Island nearly open of Lane's Island, until Gappy's Island comes open of Simon's Island, you will then clear the shoals of Filly's Point. To avoid the Harbor Rock, bring Slade and Cox's Flagstaff on with the eastern chimney of their dwelling house; it will be necessary to get this mark on before Boatswain's Island closes Bullock's Point. In coming from the westward it is advisable to make free with Fogo Island, in order that you may distinguish the small islands that form the tickle, which if passed with westerly winds can never be regained, owing to the constant set there is to the eastward. Having passed Little Motion, keep the extreme point of the head over the Narrows Point, until you get past Bullock's Point, when the above directions will clear all the harbor's dangers.

Coming from the eastward, and bound to Fogo Harbor, N. W. part of Fogo Island, you must be careful to avoid the Dean's Rock, which is a sunken rock, and lies between

Joe Batt's Point and the harbor; steer W. N. W. until Brimstone Hill, a remarkable round mountain, appears in the centre of the harbor; then steer for the East Tickle, which may be known by the lantern on the top of Sim's Island; make the west side of the tickle. Give a good berth to the the point on the starboard side, and run right up the harbor, keeping near the south side, and you will carry from 5 to 3 fathoms through: immediately you get round the point, steer S. W. to avoid the Harbor Rock, and follow the directions given above for anchoring. The middle tickle appears the widest, but it is fit only for boats; the other two must be adopted as best suits the wind.

LITTLE FOGO ISLANDS lie nearly N. E., distant 4½ miles from Joe Batt's Point; there are numerous rocks about them, both above and under water, making this part of the coast exceedingly dangerous: a little to the eastward of Little Fogo is a small rock just above water, called the North-eastern Rock, and somewhat in this direction, distant 10 or 11 miles, is said to lie Cromwell's Ledge, whose exact position is not well determined, although it is considered to be extremely dangerous. Northward of Little Fogo are the Turr Rocks, and from hence, in the direction of the western side of Great Fogo Island and the Storehouse Rocks, the Seals Nests, Gappy and Stone Islands, the Jigger and Black Rocks, and various other dangers, all having deep water round them, and tending to increase the difficulty of the navigation.

CHANGE ISLAND TICKLE.—This harbor is accessible when Fogo Harbor is not; it is very secure, and has good anchorage with 6 or 7 fathoms, muddy bottom. In general the islands about it are low and marshy, but there is abundance of fire wood, though water is scarce. The passage in from the eastward is between Ruth's Rock and the Tobacco Islands, the mark being Brimstone Head kept between both; this will clear all the dangers on the northern shore, and also off Skinner's Harbor; or you may bring the tickle to the westward between the points of the land, and steer directly through in great safety.

TOULINQUET HARBOR.—This harbor is sheltered from all winds but those which blow from the north and north-east, when, in heavy gales, it becomes dangerous. In entering, either by the east or western channel, you must take the greatest care to avoid the White Ground, to clear which, you must bring Messrs. Slade's dwelling house open of Sim's Island, and keep it so, until French Head opens through the Eastern Passage. This is very commonly called Burnt Island Tickle, and should not be attempted without you are thoroughly acquainted with the navigation, or in cases of great emergence. The anchorage is mostly foul, but the best and most secure is about 5 or 6 fathoms off Colburn's Stores; both water and wood are scarce. If the mariner should be here either early or late in the year, Back Harbor, which lies off the western side of the table land, will be found a preferable place for shelter, and a few small vessels may ride there with much safety. You may proceed in on either side of Gull Island, lying with the Western Head open of Batrix Island and the Bluff Head, or with the Eastern Stage on Batrix Island. The islands about the harbor of Toulinquet are moderately high, and bounded by dark colored slate cliffs: it may readily be known by the Gull Island or table land.

FORTUNE HARBOR.—This harbor lies between the Bay of Exploits and New Bay; it is good when attained; but the entrance, which is the Western Tickle, is extremely narrow and dangerous, on account of the high land around it; from which all winds baffle, except those blowing directly in.

TRITON HARBOR (Great Triton Island.)—The entrance to this harbor is between the Great and Little Dunier Islands; in entering you will see Francis Island, which has a reef running to the south-westward; give this a berth, but both the Dunier Islands are bold to and free from danger. Little Dunier Island lies S. W. three miles and a quarter from Sculpin Rocks, on approaching which, the harbor opens off the high land of Great Dunier: its shores are exceedingly bold, and therefore it is always to be preferred to Cutwell Harbor; its great depth of water will be avoided by running into Inspector's or Scrub Cove, where vessels may moor with hawsers to the trees, in perfect security.

The tides here, and also upon all the eastern coast of Newfoundland, have nearly the same rising, the springs being about 6 feet, neaps 4 feet; but these are much influenced by the winds.

CUTWELL HARBOR (Bong Island.)—This harbor has a spacious entrance, sufficient for the largest ship to beat in to secure anchorage, in from 10 to 5 fathoms, sand and mud: the best anchorage is about W. by N., distant three miles from the southern head. The arm runs in full one mile and a half above the Narrows, in which is abundance of wood and water, and well adapted for heaving down and refitting vessels. At the entrance is the Fool's Cap Rock, the marks for which are Copper Island seen through Indian Tickle, and Mark Island on with the White Point. To clear the Fool's Cap Rock, keep the extremity of Southern Head, touching the north end of Hardrix Island, until Green Bay Gull Island opens to the westward of the Hag Rock. The only danger within the heads is the rocks on the eastern shore, and most of these are visible at half tide.

THE ISLAND OF TOULINQUET lies to the westward of Fogo, and has several small islands about it: here is situated what is called Toulinquet Bay, and to the south-westward of Toulinquet Island is the Harbor of Herring Neck; this is said to be a spacious, fine harbor, and fit for any vessels.

CAPE ST. JOHN.—From Toulinquet Bay to Cape St. John, the course is N. W. by N., distant 12 or 13 leagues; this is a high and rugged point of land, and may readily be known by the small high round island to the south-eastward, distant from the northern pitch of the cape about 2½ or 3 miles; this is called the Gull Island, and is the third of that name on this side of Newfoundland; perhaps it will be better we should hereafter distinguish this as the Northern or St. John's Gull: that near Cape Freels, as the Middle, or Cape Freels Gull; and the one lying off Cape Bonavista, as the Bonavista or South Gull.

Between the Fogo Islands and Cape St. John the charts commonly represent various deep bays and inlets, but their particulars are very little known, although there can be little doubt the Great Bay and River Exploits, and the Bay of Notre Dame, afford many places of good anchorage, and of easy access, which, when fully explored, may become hereafter frequented, better understood, and prove highly beneficial.

LA SCIE.—About 5 miles to the westward of Cape St. John is the Little Harbor or Cove of La Scie, to sail into which there is no danger whatever, and you may anchor any where in from 3 to 8 fathoms; it is easy of access, and open to the N. N. W. winds, which throw in a heavy sea; the best holding ground is just within a little cove on the starboard side, in 15 fathoms, muddy bottom; but further in the ground is not good.

GREAT AND LITTLE ROUND HARBORS.—The former of these is a good and convenient place for vessels engaged in the fishing trade; there is no danger in sailing in or out of it, both shores being bold to: the anchorage lies within the two inner points, where vessels may ride in 4 or 5 fathoms water, secure from the weather and entirely land-locked; but Little Round Harbor, which lies round a point to the north-eastward, about one mile and a half distant, is merely a cove, and totally unfit for shipping.

NIPPER'S HARBOR.—This harbor lies to the north-eastward of Green Bay Island about 4½ miles, and is fronted by several small islands, between which are several channels; but the best and safest is between them and the northern shore, in which the water is very deep and the shores bold. The harbor is rather confined and small, and therefore only fit to accommodate small vessels; but it is the most safe and secure on the shores of Cape St. John, and has an excellent anchorage with from 7 to 14 fathoms water; the land about it is high and barren, but it is well supplied with water, and may be easily distinguished by the islands which lie off it.

PAQUET HARBOR.—About 5 miles N. W. by N. from Great Round Harbor lies Paquet Harbor; its entrance bears from the channel between the Horse Islands, nearly S. W. by S.; it may be known by its Southern Head, which is a high and rocky mountain; the Northern Head is somewhat lower, and there are three rocky islets lying directly off its point; both points are bold to, but a little to the southward of the three rocky islets is a small shoal with 2½, 3, and 4 fathoms upon it; the channel between it and these three rocks has 7, 8, and 9 fathoms, and the water across the entrance is from 8 and 9 to 19 and 20 fathoms; a similar depth continues more than a quarter of a mile in, where the harbor divides into two channels, the one running northward, the other west and south-west. The northern arm is about one-quarter of a mile long, and has 20, 18, and 19 fathoms at its entrance, becoming shallower as you advance; vessels running in here should keep the starboard shore on board, for about two-thirds up the channel; on the larboard side, there is a rocky shoal, a small part of which occasionally appears above water: on the other part of this shoal are from 3 feet to 4 fathoms: having passed this shoal steer up mid-channel and anchor in 5, 7, or 8 fathoms; the northern part near the land becomes shallow, and a rivulet here falls into the bay, which is said to issue from some extensive lakes about two miles inland. The south-western channel is somewhat narrower than the northern one, but is quite free from danger; the shores on both sides are steep to, and bold, and you will have 12, 10, 9, 8, and 7 fathoms for half a mile in; it then shallows to the head of the bay, where there is a sandy beach and a river running southward. This is a snug and secure place for vessels to run into whenever occasion may require. To the northward of the northern point is a mountain called Signal Hill, commonly having a signal-post upon it, and serving to point out its situation.

THE HORSE ISLANDS are situated nearly equi-distant between Partridge Point and Cape St. John, bearing from the latter N. by W. and N. N. W., distant about five leagues; these are two islands, and form a circuit of nearly two leagues, appearing moderately high; there are three rocks above water lying to the northward of the eastern-most; and on the east side of the same island there are some sunken rocks, which stretch out in some places near a mile from the shore; at the S. E. part of this island there is also a little cove, fit only for boats; there is probably a safe channel between these islands, but it is seldom attempted: the eastern island is the largest.

Following the shore of Newfoundland to the north-westward of Cape St. John, there

are two bays, called Pine Bay and Bay Verte; but although these may be places of good anchorage, they are little frequented by shipping.

FLEUR DE LIS HARBOR.—This harbor lies to the south-eastward of Partridge Point, from which it is distant one league, and derives its very appropriate name from three remarkable hillocks just over it. It is small, but safe, and secure from all winds, having excellent anchorage in its N. E. arm, in 4 fathoms water. To avoid a rocky shoal that lies about 100 yards off the island, borrow towards the eastern shore, until you get Bluff Head open to the eastward of the island. There is plenty of wood, but in a dry season water becomes scarce. It is, however, very conveniently situated for the fishery, and commonly is frequented by 8 or 10 French vessels.

WHITE BAY.—This is a large and extensive arm of the sea, being at its entrance, from Cape Partridge to Cat Head, full 4 leagues wide, and running in a south-westerly direction, about 14 leagues, to its head, where it is contracted to a river's mouth 1½ mile wide. In this bay or gulf are several islands, coves, and inlets, affording both anchorage and shelter: these are Lobster Harbor, Southward Arm, Middle Arm, Pigeon Islands, Westward Arm, Purwick Cove, Gransby's Island, Gold Cove, or River's Head, Goat and Sop Islands, Sop's Arm, Jackson's Arm, French Cove, Great and Little Coney Arms, and Great and Little Cat Arms.

LOBSTER HARBOR.—This is a small round harbor, with a shallow, narrow entrance, having at low water, in some places, not above 8 or 9 feet water; but when you are once entered, you will have 12 and 13 fathoms all over the harbor. Small vessels, therefore, sail in commonly at the flood tides.

THE SOUTHWARD ARM lies about 8 miles from Lobster Harbor, and further up the bay; here a ship may anchor with great safety, in 17 fathoms water, about 3 miles within the heads; but there is also good anchorage in any part below this, and before you are advanced so far up, in 20 and 25 fathoms; a little above the inner point, on the northern side, is a muscle bank, which stretches quite across the arm, and nearly dries at low water; and when you have passed this, you will have 11 and 12 fathoms water, and the channel continues deep until you approach the River's Head. This is the first great inlet on this side of the gulf, and may therefore be readily recognized.

MIDDLE ARM.—This inlet lies about 1½ mile S. W. from the Southward Arm; at its entrance is a rocky island, which is joined to the shore by a shoal, over which are 1, 2, and, in some places, 3 fathoms water. This inlet runs in to the southward, about 3 or 4 miles. To enter it you will do well in keeping the larboard shore on board: it is fitted only for small vessels. Two leagues W. by S. from Middle Arm, is Hawling Point; and between them lie the Pigeon Islands, about which the ground is good for fishing.

WESTWARD ARM.—This lies E. S. E. ½ S. of Hawling Point, and runs up nearly 4 miles; here large vessels may anchor in 18 fathoms water: there is a cove on each side of its entrance; that to the north-eastward is named Bear Cove, where smaller vessels may moor securely, and ride safe from all winds, in about 12 fathoms water; the other is called Wild Cove, a very indifferent anchorage, open to the north-westerly winds, and the bottom rocky and foul.

PURWICK COVE.—About 5 leagues down from the River's Head, and near the S. E. side of the bay, lies Gransby's, or Mid Bay Island, without either cove or place of shelter: on the south-eastern part of this island is a shoal running off the length of two cables, with not more than 9 feet water over it; and nearly abreast of this island, on the S. E. side of White Bay, is Purwick Cove, where shipping may find safe anchorage, and lie with good conveniences for the fisheries.

Having passed to the southward of Gransby's Island, the bay narrows and runs up about 5 leagues towards Gold Cove, where the river branches out into several streams, and is commonly called the River's Head.

On returning up the western side of White Bay, you will perceive Sop's Island, about 3 miles in length, and 11 miles in circuit; near its southern end is Goat's Island; these form a long passage, or arm, called Sop's Arm, at the north part of which a vessel may safely anchor, just inside the north side of Sop's Island; this will be the best side of the channel, or passage, into the arm; but there is anchorage in deep water between Sop's Island and the main before you reach so far up as Goat's Island: there is also a small cove at the north end of the island, called Sop's Cove, and two other coves opposite the main, called Hart's Coves, in all which the fisheries are carried on, although ships generally anchor in the upper part of the arm, and withinside of Goat's Island.

JACKSON'S ARM.—About 4 or 5 miles to the northward of Sop's Island, is Jackson's Arm, to enter which, you will pass a ragged point, low and round; the water here is deep, except in a small cove on the starboard side, where a vessel should moor head and stern: this place affords the largest timber in White's Bay. Frenchman's, or French Cove, is about a league to the northward of Jackson's Arm, and offers good and safe anchorage.

LITTLE AND GREAT CONEY ARMS.—Nearly 4 miles to the north-eastward of Frenchman's Cove, is Coney Arm Head, the most remarkable land on the western side

of White Bay, and bears W. N. W. ¾ W. distant 6 leagues from Cape Partridge; the land here projects out one mile and a half, forming a deep bight, called Great Coney Arm. In this place there is no good shelter for shipping; but in Little Coney Arm, which lies to the westward of the head, is convenient anchorage for small vessels, although its entrance is too shallow for large ships: here fishing craft frequently rendezvous.

GREAT AND LITTLE CAT ARMS.—To the north-eastward of Coney Arm Head, distant 3 miles, lies the Great Cat Arm, and 5 miles further is Little Cat Arm; this latter inlet runs up to the westward full two miles; off its northern point are some rocks above water, to avoid which, keep near to the southern shore; you will find the water deep, and no good shelter, unless you approach the head or further end of the arm, where you will lie secure and land-locked.

LITTLE HARBOR DEEP.—You will now be to the northward of White Bay, and following the shore, will perceive the entrance to Little Harbor Deep, called by the French La Vache; this place is much exposed to south-easterly winds, and by no means a good harbor; off its northern point are some rocks, which are always above water; they lie half a mile from the shore, and afford good fishing about their environs; the water is not very deep in any part of this inlet, and when you get half way from the entrance to the head, or further end, it becomes quite shoal.

GRANDFATHER'S COVE, or L'ANCE L'UNION, is an inlet about two miles deep, lying one mile and a half from Little Harbor Deep; this is also open to the southerly winds, and may be known, when near the shore, by the northern point appearing like an island, and bearing N. N. W. ½ N. from Cape Partridge: it is but an indifferent place for shipping, and seldom frequented.

ORANGE BAY, or GREAT HARBOR DEEP.—This may be known from any other inlet, by the land at its entrance being much lower than any land on the north side of White's Bay, and by its bearing north, distant 5 leagues, from Cape Partridge; it forms a large harbor, and when you get about three miles within its entrance, divides into three branches; in the northern arm the water is too deep for vessels to anchor, until they have run up near the head; but the middle arm has a good bottom, and safe anchorage in 6 and 7 fathoms water. A little within the entrance of Orange Bay there is a cove on each side frequented by the fishing vessels; but these are very dangerous for a ship to lie in, for, although they moor head and stern, yet should a gale come on from the eastward, there is little safety to be depended upon.

FOUCHE'E.—This place is little frequented, and there is no anchorage until you approach its further end, where you will find a cove on the northern side; this cove is 2 or 3 miles above the entrance, and very small vessels may anchor there in 18 fathoms, mooring head and stern. The land on both sides is extremely high and steep to the shore; there is also another arm running in above two miles further than the cove, but it is so narrow, and has such a depth of water, that it is almost useless to shipping.

HOOPING HARBOR.—About eight miles to the north-eastward of Fouchée, and a little to the south-westward of Canada Head, lies the entrance to Hooping Harbor, or Sans Fond. This place has two arms or bays, one running up northward, the other westerly: like many of the adjacent inlets, there is deep water all the way, until you get near to the head of the northern branch; there the bottom is a kind of loose sand, open to the southerly winds, and by no means a safe place to lie in; but in the western arm a vessel may anchor in a moderate depth with safety.

CANADA HEAD lies about three miles to the south-westward of Canada Point, or Bide's Head; it is elevated land, and very easily to be distinguished, either from the northward or southward; but when you are directly to the eastward of it, it becomes hidden by the high land up the country, commonly called the Clouds.

CANADA BAY.—This is an inlet of considerable size and extent: at its southern entrance is Canada Head; from whence it runs N. N. Easterly full 5 leagues; here vessels caught in easterly gales may seek shelter, and anchor in safety: in entering, when you get above the two rocky islets which lie near Bide's Head, and called the Cross Islands, you will see a low white point, and another low black one a little beyond it; off this latter, distant two cables' length, lies a sunken rock; keep therefore towards the middle of the bay, and you will find no danger, except a rock above water, which lies about a mile below the point of the narrows; this you will endeavor to leave on your larboard hand, keeping mid-channel, and you will have 18 fathoms through the narrowest part. Soon after you have passed the narrows, the bay widens, and is above a mile across, and you may then anchor in from 18 to 20 fathoms, good holding ground, and secure from all winds. But this bay is not much frequented, and only occasionally resorted to in case of necessity

ENGLE'E HARBOR is situated on the north side of Canada Bay; to sail into this place, you must pass a low point, appearing white, and forming the northern point of entrance to Canada Bay; then keep near the shore until you get abreast of the next point, which makes the harbor: haul round it to the S. E., taking care not to come too near the point, for it shoals a full cable's length off; having so far advanced, you can anchor in from 15 to 7 fathoms, good holding ground; but this is well up the cove, which is too

small to lie in, unless you moor head and stern. In Bide's Arm, which runs up N. N. E. from Englée, almost 2 leagues, there is no good anchorage, the water being too deep; but within the south end of Englée Island is a good harbor for shallops, although from thence to where the ships lie, there is no channel, even for boats, unless at high water, or beyond half tide.

CONCH HARBOR bears nearly E. N. E. ½ E., distant 7 or 8 miles from the entrance of Canada Bay: it lies very open to the winds from the south, but has good anchorage well up to the head, in 11 fathoms water, good holding ground. S. by W. from Conch, distant 2 leagues, is Hilliard's Harbor, called by the French, Botitot; this is a bad place for shipping, but very convenient for the fishing craft.

CAPE ROUGE HARBOR.—This harbor lies to the westward of Groais and Belle Isle Islands, which contribute to shelter it from the heavy swells of the Atlantic; the southern part of its entrance is shallow and rocky, and in the S. W. arm is the Harbor Shoal. The best anchorage is in the northern arm, in any depth of water. Ships may beat in or out, but the centre of the harbor is too deep for anchorage. Directly opposite to its entrance is a small island, which is named after the harbor, Rouge Island; its northern end requires a berth in passing.

BELLE ISLE and GROAIS ISLAND.—These are high islands lying off the N. E. coast of Newfoundland, from which they are separated 9 or 10 miles. Belle Isle is the southernmost and the larger island, being 8 miles in length and 3 broad; there is a little harbor at its south part, where fishing craft occasionally resort, but not calculated for shipping: other coves may be found about the shores of the island, where shallops sometimes take shelter. Off its south-eastern side lies Green Island, a small rocky islet, and to the southward a bank of soundings extends with 12, 20, 25, and 30 fathoms; there are some rocks, both above and under water, at the south point of Belle Isle, but these lie close in to the land.

GROAIS ISLAND lies to the north-eastward of Belle Isle, and is about 8 miles in length, and 2½ miles broad, its northern point lying in latitude 51°. Off this end, and also off the N. W. part of the island, are several rocks above water; otherwise this island is bold all round, and between it and the main are from 20 to 70 fathoms water; there are also two islets mid-way; the southern one is commonly called Red Island; they are both steep to, and without any known danger.

CROQUE HARBOR.—The entrance to this harbor is half a mile wide, and somewhat difficult to discover; it bears N. W. from Groais, distant 3 leagues. When the north point of Belle Isle is clear of the southern point of Groais, you will be a little to the southward of Croque; and this mark will not fail pointing out to those unacquainted with this navigation the fairway to its entrance, especially as the headland forming the southern shore is bare of trees and has a round appearance, with some rocks, which are always visible, and lie about 40 yards to the S. E. of it. The shores of the harbor are bold to, and even a frigate may easily work into it; the anchorage is excellent, being good holding ground, of dark slate-colored mud. Having opened the harbor's mouth, steer in N. W. by N., proceed mid-channel, and when you have advanced up about a mile, you will see the river divide into two branches; anchor hereabout. There is a little cove at the southern entrance, called Irish Bay, in which are 13, 10, 8, and 5 fathoms, and two rocks above water at the head of the bay, near which is a little rivulet of fresh water.

GREAT AND LITTLE ST. JULIEN.—To the north-eastward of the harbor of Croque lie Negro and St. Julien's Islands, near which are the harbors of Great and Little St. Julien, and also that of Grandsway: these are all adjacent to the Island of St. Julien, and bear to the north-westward of the northern part of the Island of Groais. The S. W. end of the Island of St. Julien is but little separated from the main, and cannot be distinguished to be an island until you arrive very near it; there is at this end no passage except for boats; therefore to sail into either of these harbors you may keep close to the north-east end of the island, and in passing that, the harbors will open to your view.

Great St. Julien is the easternmost harbor, to which there is no danger until you get within the entrance; then you will find the starboard shore to be shoal nearly one-third over; but when you have passed the first stages, you may anchor in from 8 to 4 fathoms water.

To sail into Little St. Julien's you will first steer for Great St. Julien's Harbor, in order to clear a sunken rock, which lies directly before the harbor's mouth; and having arrived opposite the entrance of Grandsway, steer into the harbor, and anchor in 5 or 4 fathoms water. It will be requisite for all ships which go into either of these harbors to moor both head and stern; but Grandsway is not a harbor for shipping, although it is extremely convenient for fishing craft.

CREMALLIRE and GOOSE COVES.—These places lie on the northern shores of Hare Bay; Cremallire has spacious and good anchorage in 7 or 8 fathoms, and is supplied with abundance of wood and water. Trois Montagnes is merely a small creek, in which a few French vessels moor during the winter season. It is situated to the southwestward of Cremallire, and has a rivulet which extends eastward to Goose Cove.

Goose Cove is situated on the western side of Goose Cape; it is small, but very secure, and has most excellent anchorage in 4 or 5 fathoms. Vessels can sail into it with a westerly wind, or into Cremallire with an easterly one.

ST. ANTHONY'S HARBORS.—This lies a little to the north-eastward of Cremallire Bay, and is a very safe place, having good anchorage with 6 and 7 fathoms water, on a bottom of blue clay; its entrance lies west, distant one mile and a half from Cape St. Anthony. It cannot be easily mistaken, from the remarkable high land on its southern shore. It is well supplied with wood and water, and is commonly frequented by some French fishing vessels.

BRAHA HARBOR.—This harbor is small but safe, having good anchorage within it; the bottom is sandy, and the shores are bold and steep to. The Braha Shoal lies S. 74° E. (true) distant 1½ mile from the Needle Rocks: it is reported to have not more than 6 feet water over it, but Capt. Bullock says he never found less than 16 feet: with a little sea it occasions breakers, but the common current will always create a constant ripple.

HOW HARBOR lies on the northern shore of Hare Bay. The entrance to this place bears N. 48° W., distant 12 miles from Fishot's Northern Island, and is by far the best harbor in Hare Bay, having safe anchorage over every part; the surrounding hills are barren, but small stunted wood may be found in the valleys. To the northward a range of marshes and ponds extends as far as Pistolet Bay. The harbor is about half a mile wide, and a full mile and a half long; a small rock lies off the western point, but it is very near the land, and the upper part of the harbor shoals gradually.

ST. LUNAIRE BAY.—This excellent harbor will contain 100 vessels in perfect security, is remarkably easy of access, and may always be recognized by the appearance of the White Cape; the best and most convenient anchorage will be found at Amelia Cove, in from 5 to 7 fathoms. The approach and entrance are bold and steep to, only observing to give the point of the Southern Islands a good berth. Both wood and water are to be obtained without difficulty, and it affords in every respect a good and secure anchorage.

GRIGUET BAY and CAMEL'S ISLANDS HARBOR.—The North Bay is insecure in spring and fall, on account of its being exposed to the southerly gales; the S. W. Bay is therefore recommended, where there is good anchorage in 5 or 6 fathoms water. Camels' Islands Harbor will always be found too intricate for a stranger, and should never be attempted without the assistance of a pilot.

THE NORTH HARBOR runs in with Stormy Cape, and has at its entrance a rock above water, which is bold to all round, and vessels may sail on either side of it, and anchor in 6 fathoms water. In the passage which leads to the N. W. and S. W. Harbors, there is an island which contracts the channel, rendering the passages narrow; the best and safest entrance is to the northward of this island, giving the outer point of the N. W. Harbor a little berth, and so soon as you get within the island you will open both harbors; that which runs in north-westward is the larger of the two, and is two miles deep; you should sail up on its western side, having 14, 16, and 18 fathoms, until you get inside the point, a little within which is a bank of 7 or 8 fathoms; but when you have passed over this, you will again drop into 16 and 17 fathoms; and as you approach the head of the bay, you will lessen your water to 7, 6, and 5 fathoms, every where good anchorage, and well sheltered from all winds. The two Islands of Griguet lie outside of Camels' Island, and together form between them several small but snug harbors for fishing vessels.

WHITE ISLANDS.—You will now perceive the White Islands, lying to the northward of Stormy Cape, from which they are distant one league and about 2½ miles from the shore opposite; they are small, of moderate height, and have several rocks inside, both above and under water; but these are not considered to be dangerous, as they are easily discoverable, even in fine weather, and the passage between them and the main is very safe.

QUIRPON ISLAND.—This lies off the north-eastern part of Newfoundland, and forms the S. E. point of entrance to the Strait of Belle Isle; it is large, high, and barren; and Cape De Grat is visible in clear weather, full 12 leagues to seaward.

LITTLE QUIRPON.—There is a narrow channel which runs in to the southward of Quirpon and divides it from the main; here lies Little Quirpon Harbor, to enter which there is no danger but what you will easily perceive; vessels commonly moor head and stern, and lie there perfectly secure.

DEGRAT AND PIGEON COVES.—These coves lie on the eastern side of Quirpon Island, and to the northward of Cape Degrat; at their entrance are several small rocky islets and rocks above water, and affording behind them very fair security for shipping, in 4 fathoms water, and good conveniences for fishing. Bauld Cape, which is the northern extremity of Quirpon Island, lies in latitude 51° 39′ 45″ N., and in longitude 55° 27′ 50″ W.; it is rocky and steep to, and may be approached very near, with great safety; having rounded this Cape you will perceive a rocky point to the southward leading to the Harbor of Quirpon.

GREAT QUIRPON HARBOR lies on the N. W. side of the island, and its entrance is between it and Grave's Island; in your approach towards it from the northward you may borrow as close as you please to Bauld Head, there being no invisible danger until

you arrive at the entrance to the harbor, where there are some shoals which must be left on your larboard side: to do this keep Black Head on Quirpon Island open of all the other land, until Raven Point comes over Noddy Point, then haul in for the harbor, going not nearer than the distance of half a cable's length from the point of Grave's Island; the anchorage within the island is every where good, with room and depth enough for any ship, and the ground holds well; but the best place to ride in will be towards the upper end of Grave's Island, abreast of Green Island, in 9 fathoms water; the psssage to the Inner Harbor, on either side of Green Island, is very good for ships of moderate water, through which you will have 3 fathoms, and above Green Island you have excellent riding in 7 fathoms. There is also a passage to this harbor through Little Quirpon Harbor, but it is too narrow and intricate for any one to attempt, unless they are perfectly acquainted with the navigation.

NODDY HARBOR.—This place lies a little to the westward of Quirpon Harbor, and runs in between Noddy Point and Cape Raven; there is no danger in entering, and you will pass to the starboard of the little island that lies about a mile within the entrance, and anchor above it in 5 fathoms water; or you may, with a small vessel, run further up into the basin, and anchor in 2½ or 3 fathoms; here is a stage within the island, and on the eastern side of the harbor, with convenient room for many vessels.

GULL ROCK and MARIA'S LEDGE.—The Gull Rock lies W. N. W. from Bauld Cape, in the island of Quirpon, distant 2½ miles; and N. N. E. ¾ E. nearly 3 miles from Cape Raven; it is always above water. Maria's Ledge lies nearly S. W. from the Gull Rock, distant 2 miles, and N. by E. 1½ mile from Cape Raven, being distant about a mile from Maria's Head. In standing in from the northward for either QUIRPON or NODDY HARBORS, you need be under no apprehension of danger from the Gull or Maria's Rocks, for both are above water, the passage between them is half a league wide, and very safe; but it will be prudent to pass nearer the Gull Rock, because of the N. W. Ledge, which never appears but in bad weather: this N. W. Ledge bears W. a little S., distant 1¾ of a mile from the Gull Rock, and you should not attempt the passage between it and the main, on account of other rocks that are said to lie about it, and places of shallow water.

To the westward are the Sacred Islands: Great Sacred Island lies about N. W. by W. ¼ W. from Bauld Cape, distant 5½ miles, and S. E. by E. ½ E. from Cape Norman nearly 13 miles. Little Sacred Island is one mile to the southward of the great island; the passage between them is safe, and you may sail round both, for they are high and bold; within them, on the main and to the W. South-westward, is Sacred Bay, tolerably large, with numerous rocky islets within it: the shores of this place abound with wood, and therefore it is much resorted to for the use of the fisheries at Quirpon and Griguet, &c. Cape Guion forms the north point of Sacred Bay, being high and steep; near it is a remarkable rock, called the Mewstone, and much resembling that in Plymouth Sound. There is a little cove to the southward of this rock, where a vessel may occasionally resort to with safety.

HA HA BAY.—From Cape Onion to Burnt Cape the course is W. ¾ N. about 6 miles; it has a white appearance, and rises from the seaward to a considerable height. On the eastern side of Burnt Cape is Ha-ha Bay, which runs in southerly about 2 miles; it lies open to northerly winds, but when you are within the cape you will find anchorage in 6 or 7 fathoms; or you can go further up and ride well sheltered in 3 or 2½ fathoms. This is a convenient place for the fisheries, and has plenty of wood.

PISTOLET BAY.—This bay lies between Burnt Cape and the Norman Ledges, which bear from each other N. W. by N. and S. E. by S., distant 8 miles; the bay is extensive, and reaches several miles each way, having good anchoring ground in most parts, particularly on the western side, a little above the islands, in about 5 fathoms water; the shore is tolerably well furnished with wood, and contributes to supply those places which are destitute of that article.

COOK'S HARBOR lies in the N. W. part of Pistolet Bay, and within the islands, about two miles above Norman Ledge Point, These ledges are about one mile to the eastward of the north point: to clear these dangers as you enter, be sure to keep Burnt Cape well open of the outer rocks, that lie off the islands at the western entrance to Pistolet Harbor; and if going in, so soon as you consider yourself to be to the southward of these ledges, steer in for the harbor, leaving the islands and rocks on your larboard side; keep the southern shore on board, for fear of a ledge of rocks that juts out from a little rocky island on the other side; and so soon as you get within the island haul over for the northern shore, and anchor in 4 or 5 fathoms water. This harbor is capable of being made very convenient, and several fishing rooms and proper stages for the boats to resort to, and cure their fish, might be erected in all the coves between it and Cape Norman.

CAPE NORMAN is the northernmost point of Newfoundland, being of a moderate even height, and very barren appearance, which continues far inland; it is about a league to the north-westward of the ledges; from Cape Norman the shores of Newfoundland turn south-westerly, and will be described hereafter.

BELLE ISLE.—This island, which lies at the entrance of the strait to which it communicates its name, should be called the Northern Belle Isle, to distinguish it from those we have already described, lying to the southward; it is about 8 miles long and 3 broad or 7 leagues in circumference being distant from Bauld Head in Quirpon Island, about 14 miles, and from the coast of Labrador 12 miles; it is moderately high, and wears a uniform sterile appearance. On its north-western shore there is a small harbor called Lark Cove, or Harbor, lying within an island almost close to the land, and fit only for small craft; and at the eastern side of this island is another cove, called Batteaux Creek, frequented occasionally by shallops. About two miles to the north-eastward of this island lies a ledge of rocks, part of which appear above water, and over these the sea breaks very high; this is called the N. E. Ledge; you will have 15 and 20 fathoms close to it, and 55 between it and the north part of the island. The soundings about this Belle Isle are very irregular; near the island you will seldom find less than 20 fathoms, except on a small bank said to lie to the northward, distant 4 miles from its north-eastern part, whereon are only 5 fathoms. The northern part of this island is said to lie in about the latitude of 51° 57′ N.

Soundings in the Strait of Belle Isle.—In crossing the Strait of Belle Isle from Quirpon to Chateaux Bay, your soundings will be irregular; from 20 to 30 fathoms on the Newfoundland side, and in some places from 30 to 38 fathoms; in the stream or middle of the strait, you will find 25 and 35 fathoms, coarse sand and broken shells; and towards Chateaux Bay, 45 to 80 fathoms, and within a mile of the coast of Labrador, 35, 30, and 25 fathoms. To the northward, between Belle Isle and St. Peter's Bay, there are 59, 87, 96, 63, and 20 fathoms.

THE SOUTHERN COAST OF NEWFOUNDLAND,

FROM CAPE RACE TO CAPE CHAPEAU ROUGE.

PRELIMINARY REMARKS.—Vessels bound towards the Gulf of Newfoundland should take the greatest care to notice and make a proper allowance for the currents, which set from the eastward, all along the southern coast of Newfoundland, with frequently fatal velocity; causing an impetuous indraught into the various bays, and occasioning the much to be deplored loss of many lives, and the wreck of numerous vessels; these local currents chiefly prevail on that part between Cape Race and Cape Ray: more vessels have been cast away on the small point of land which divides the two bays of Trepassey and St. Mary than on any other part of the island: that these accidents were occasioned by the currents there can be little doubt.

An able navigator, who has been 20 years employed in the fisheries, and who is a native of Newfoundland, observes, it is well understood by all the boat masters, that there is in general a strong current setting in from the eastward, along the western coast of Newfoundland, which, after passing Cape Pine, runs more towards St. Mary's and Placentia Bays; this current will be felt at least 20 leagues to the S. W. of Cape Pine, and becomes more rapid as you approach the land; its velocity increasing as the winds favor its direction; but at all times of sufficient magnitude to endanger the safety of any vessel approaching from the south or west in foggy weather, and being ignorant of its existence.

In order to avoid the danger arising from this current, the fishermen, in foggy weather, when returning from the western coast to their homes on the eastern shore, invariably use the lead, depending more upon the depth of water than their compass, and always keeping a sufficient distance from the land to insure the safety of the vessel. On passing to the eastward of Cape Race they never approach nearer to the land than 35 fathoms water; the ground being more of an inclined plane on the west than on the east coast, you will find that depth of water at a considerable distance; the ground becomes more broken, and the depth of water increases so fast, that in your course from Cape St. Mary's to avoid Cape Race you will, when to the eastward of it, find yourself in 50 fathoms, and when advanced a very short distance further, you will drop into 60 and 70 fathoms; consequently, you will then be clear of any land, and may safely pursue what course you think proper; but, in all this navigation, the mariner's safety may be insured by a due attention to the lead.

CAPE RACE is situated on the southernmost part of Newfoundland, and lies S. W. ½ W., distant 3 leagues from Cape Ballard: before it lie 2 or 3 rocks above water, these are close to the land, and have 10 fathoms water very near them. Between 6 and 7 miles E. S. E. from Cape Race is the New Bank, being 4 miles long and 1½ broad, and lying N. E. by N. and S. W. by W.; on it are 17, 20 and 25 fathoms, with very deep water on its outside, and 30 fathoms just within it. Vessels making this part of the coast may know their approach toward the land, by suddenly lessening their water to the above depths.

The Virgin Rocks, which are dangerous, lie in the direct track to Cape Race, Newfoundland, the point which vessels bound to Quebec generally endeavor to make. (See page 13.)

Near Cape Race is a small inlet named Cripple Cove; the land then turns westerly towards Mistaken Point, a distance of 4¼ miles; the shores are bold, and off mistaken Point is a rock above water. N. W. by W., about two miles, is the French Mistaken Point; this also has a rock off its extremity; from hence the shore winds N. by W. into Trepassey Bay, at the northern part of which lies Biscay and Mutton Bays, and Trepassey Harbor. The two former of these are seldom frequented, and it is considered dangerous to get embayed there, for the sea commonly drives in, and there is hardly any current to help you out again. Mutton Bay is formed to the eastward by Cape Mutton, and to the westward by Cape Powles; this last is the extreme point of a narrow neck of land that divides Mutton Bay from Trepassey Harbor; it is a long, low, sandy, and stony beach, over which the ships lying in Trepassey Harbor can be distinctly seen. Mutton Bay is about 2 miles deep, and has from 12 to 3 fathoms water in it; but the bottom is foul and rocky.

TREPASSEY HARBOR.—The entrance to this harbor is to the westward of Cape Powles, and the direct course in will be N. E. ½ E. Cape Powles lies from French Mistaken Point N. W. about 8 miles; from Cape Mutton W. S. W. ¾ W. one mile; and from Cape Pine N. E. by E. 5 miles. The entrance to Trepassey Harbor is three-quarters of a mile wide, and continues of that breadth full 2½ miles up; it then narrows to less than half a mile, and opens again to its former width, and there vessels commonly ride. To enter this harbor ships commonly steer over from Mistaken Point towards Cape Pine, until you fairly open the harbor; you may then safely run along the shore, for it is bold; in sailing into the harbor, you will meet with a rock on the south-eastern shore, lying about a mile from Powles Head, and one third of a cable's length off the shore; there is, also, on the northern side, a shoal which runs along up the harbor, so far as a low green point; to clear this shoal, bring Baker's Point on with a low rocky point at the entrance of the harbor; and when you get so far up as the low green point, you may steer more westerly, and anchor either in the N. W. or N. E. arm, in 5 or 6 fathoms water; both wood and water can be obtained with ease.

From Mistaken Point to Cape Pine the course and distance are W. N. W. ¼ W. 4 leagues and a half; and from Cape Pine to Cape Freels, west, one mile. The land about Cape Pine is barren and moderately high; from Cape Freels, the shores extend W. N. W. one mile to Black Head, and thence N. W. ¾ W. to the eastern reef, and head of St. Shot's Bay.

ST. SHOT'S BAY.—This is the fatal spot where so many vessels have been recently wrecked; the bay is about a mile deep, and from the eastern to the western head, the bearing is N. by W. ¾ W., distant two miles: it lies entirely open and exposed to the sea.

ST. MARY'S BAY.—This is an extensive bay, or gulf, commencing on the eastern side at St. Shot's, and on the western side at Point Lance; the course from the eastern head of St. Shot's to Point Lance being N. W. ½ W., about 20 miles; from thence the land runs up E. N. E. 9 leagues and a quarter; the land on each side being moderately high, and having several good harbors in it. In proceeding from St. Shot's along the eastern shore you will pass two little coves, and reach Gull Island: this lies close in to the land, and bears from the western head of St. Shot's N. ¼ E., distant 4 miles.

Grom Gull Island to Cape English the bearing and distance are N. by E. ¾ E. two leagues; Cape English is high table-land, terminating in a low rocky point, and forming a bay, about a mile deep, to the southward of it; at the bottom of this bay is a stony beach, within which is Holyrood Pond, running E. N. E. nearly six leagues, and from half a mile to 3 miles in breadth; this occasions the cape to appear like an island when you are to the southward of it. One mile and three-quarters N. E. ¼ N. from Cape English is False Cape; six and a half miles E. N. E. from Cape English is Point la Haye: this is low, and has a ledge of rocks running from it about a quarter of a mile into the sea, and above a mile along the shore, on which the waves break furiously in bad weather; this is the only danger you will meet with in St. Mary's Harbor.

ST. MARY'S HARBOR.—From Point La Haye to Double Road Point, which is the southern extreme of St. Mary's Harbor, the course and distance are E. N. E. one mile and a half; the land between is low and wears a barren appearance. Within Double Road Point is Ellis's Point, distant half a mile; these two form the starboard points of entrance to the harbor, which is here nearly a mile wide. You will now perceive the river to be divided into two branches, the one running E. N. E. into what is called Mal Bay, the other south-easterly into St. Mary's Harbor. When you are within Ellis's Point, in St. Mary's Harbor, you can haul to the southward, and anchor abreast of the fishing-stages and houses, upon a flat, in 4 or 5 fathoms water, where you will ride land-locked: this flat runs off shore about half a mile, and between it and the opposite shore are from 15 to 30 fathoms water. The best anchorage is about two miles above the town, opposite to Brown's Pond, where it is above half a mile wide; here also you will lie land-locked in 12 fathoms, and have excellent ground to the further end of the bay.

MAL BAY, on the E. N. E. branch, is about one mile wide, and runs up 2¼ miles; but the anchorage is not good; a heavy sea frequently sets into it, and unless you run up to

its very head, in 5 or 6 fathoms, you can have no place even for occasional security; it therefore is seldom resorted to. The entrance to these harbors bears from Point Lance nearly east, distant 19 miles. From Trapeau Point, the coast runs N. N. E. ¼ N., above two miles, to Shoal Bay, and opposite to the northern point of this Shoal Bay lies Great Colinet Island; this is about a league in length and one mile broad; the southern end of which bears from Cape English N. by E., distant three leagues; there is a safe channel on either side of this island, only taking care to give Shoal Bay Point a good berth of a quarter of a mile, in order to avoid some rocks which lie off it. On the northern side of the Great Colinet is a stony beach, off which runs a bank with from 7 to 17 fathoms water, rocky ground. One mile and a half north-eastward from Great Colinet is Little Colinet Island, above a mile in length and half a mile in breadth; there is deep water all round it.

GREAT SALMON RIVER.—E. N. E., five miles and a half from the northern part of Little Colinet Island is the entrance to Great Salmon River, which is nearly three-quarters of a mile wide, and runs E. N. E. 7 or 8 miles. About 3 miles up this river, and on its southern shore, is an opening called Little Harbor; opposite this, in a small cove, is the best anchorage in the river, although it is generally good throughout: here you may ride safely in 5 or 6 fathoms water; the river narrows as you advance up it, and towards its furthest end becomes very shallow.

COLINET BAY.—N. W. by N. from the entrance of Great Salmon River, distant 2¼ miles, and N. E ½ E. 5½ miles from Little Colinet Island, is the mouth of Colinet Bay; between Salmon River and Colinet Bay, is a cove a good mile and a half deep, with from 13 to 4 fathoms in it, but it is exposed to the S. W., and therefore not much resorted to. Colinet Bay runs in N. E. by N. about 2 miles, where the point of an island on the starboard side narrows the passage, having passed which the channel opens wider again, and the top of the bay is a sandy shallow beach; throughout the whole of Colinet Bay the anchorage is good; you will have from 12 to 6 fathoms water up to the narrows; in passing the narrows there are 7 and 8 fathoms, and above it 6, 5 and 4 fathoms; all good ground.

NORTH HARBOR.—To the W. S. W. of Colinet Bay, 4 miles, and N. by E. about 2 miles from the northern end of Little Colinet Island, is the entrance to North Harbor, which is three-quarters of a mile wide, and runs up to the northward 3 miles; the anchorage is very good about two miles up the river, where it is half a mile wide, in 5 or 6 fathoms; or vessels may run further up, where two sandy points stretch out, being half a cable's length asunder; keep the starboard point on board, and anchor close within the starboard shore. In entering North Harbor always keep mid-channel, for the eastern land is somewhat shallow.

The land now trends W. S. W. ½ S. towards Point Lance; there are one or two coves in the way, but no place fit for the reception of shipping.

POINT LANCE lies in lat 46° 48′, and is a low ragged point, although the land in the interior rises up and becomes highly elevated. We have already stated that the course and distance from the eastern head of St. Shot's to Point Lance is N. W. ½ W. about 22 miles; from Point Lance to Cape St. Mary is N. W. ½ W. about 6½ miles.

CAPE ST. MARY is a high bluff point of land, making like Cape St. Vincent's on the coast of Portugal; the land to the northward along shore, to a considerable distance, has an even appearance, and is nearly of equal height with the cape itself. W. by S. from Cape Lance, distant full two miles, lie the Bull and Cow Rocks; these are two flat rocks lying very near each other, and having many small rocks about them; about a similar distance, but nearer to the main, is another rock appearing at half tide; there are 10 fathoms between it and the shore, and 15 fathoms between it and the Bull and Cow Rocks. In a similar direction to the Bull and Cow Rocks from Cape Lance, but at 3 leagues distance, and nearly S. S. W., distant 7¾ miles from Cape St. Mary's, are two other little rocks, appearing just above the surface of the water, and having the sea constantly breaking over them; they lie S. S. E. and N. N. W. from each other, distant 3 cables' length, and have 15 fathoms between them; the same depth of water is all round them, excepting towards the S. S. E., where only 6 fathoms will be found 2 cables' length off. Between these rocks and Cape St. Mary are 32, 25 and 19 fathoms water; and near the Cape are 13, 14 and 15 fathoms. Vessels therefore may proceed between them, and also between the Bull and Cow Rocks and the main, if necessary, for there is no hidden danger; but perhaps it will always be more prudent to go to the southward of both.

PLACENTIA BAY.—The entrance to Placentia Bay is formed by Cape St. Mary on the east, and Cape Chapeau Rouge, or Mountain of the Red Hat, on the west; the former lying in latitude 46° 49′ N. the latter in 46° 53′ N., bearing from each other W. N. W. and E. S. E., distant 17 leagues. Cape Chapeau Rouge is the most remarkable land on all the coasts, appearing higher than the surrounding shore, and somewhat like the crown of a hat, from which singularity it obtains its name; it is visible 11 or 12 leagues to seaward, in clear weather.

From Cape St. Mary to Cape Breme your course will be N. by E. about 9 miles, and from Point Breme to the Virgin Rocks N. E. by E. 13 miles: these rocks lie 1¼ mile from the main, and always appear above water; a little to the southward of the Virgin

Rocks are some whitish cliffs in the land, by which it may be known if falling in with the land hereabouts in thick weather.

From the Virgin Rocks to Point Verde, the southernmost point of Placentia harbor, the course and distance are N. E. by E. ¼ E. 5 miles; from St. Mary's Cape to Verde Point there is no harbor or place of shelter for ships of any size.

PLACENTIA HARBOR.—Point Verde or Green Point is low and level, and forms the southern point of the road; it has a pebbly beach on each side, and several fishing stages within it; at the end of this beach, is a high rocky cliff, extending to the S. E. corner of the bay, where it again terminates in a pebbly beach; this beach then runs E. N. E. one mile to the Fort Point, and on the inside, which faces the S. E. arm of the harbor, stands the town of Placentia. A little southward of the town is a high hill, with a remarkable cliff on the middle of the beach. The outer side of the north point is level, with a clay cliff on its outer part, bearing nearly N. E. by N., distant from Point Verde 1½ mile; from this point the land forms a small bay, with a stony beach round it, to the corner of the cliff under Signal Hill; this cliff continues to Freshwater Bay, which is formed in a valley between Signal Hill and Castle Hill, having a pebbly beach round it; here a small rivulet runs down the valley, at which vessels may obtain water; to sail into this road, if coming from the southward, you should keep a league off the land, in order to avoid the Gibraltar Rock, which lies about two miles to the westward of Green Point, and has only 8 feet water over it; the mark to go to the northward of which is the castle, standing on a hill at the northern side of the harbor, and very conspicuous to seaward, open of Point Verde; when you have this castle on with the point, you will pass a little to the northward of the rock, but when you have the castle well open of the point, you will give the rock a wide berth; run in with this mark, keep your lead going, for there are regular soundings on both sides, and give Green Point a good berth of 2 cables' length, passing it in 4 fathoms water; then proceed to the anchorage in Freshwater Bay, and under Castle Hill, at three quarters of the distance over from that side, where you will lie in 6 or 7 fathoms water, good ground. At the bottom of the road is a long beach, which terminates in a point to the northward, on which stand some houses and an old fortress; there is also a fort on the opposite point; the entrance to the harbor is between these; it is very narrow, not above 60 fathoms across, and has 3½ fathoms water in it; when you get within these points the harbor opens, becomes one third of a mile wide, and extends E. N. E. above 1½ mile, where ships may lie in perfect security with 6 and 7 fathoms water; in going in keep nearer to the starboard side; the stream runs into the harbor more than 4 knots an hour. The tide rises 6 or 7 feet; and it is high water, full and change, at 15 minutes after 9 A. M.

N. E. ½ E. from Point Verde, distant two miles, and N. N. W. from Moll Point, about ¾ of a mile, is the Moll Rock, over which are only 12 feet water, with 8 and 10 fathoms near it. N. E. by N. 5¼ miles from Point Verde is Point Latina; S. W. from Point Latina, distant one mile, is the Wolf Rock: these lie about half a mile from the main, and between Placentia Harbor and Point Latina, and therefore must have a good berth in passing; the shore all the way is low near the sea, but high and ragged inland; a large mile to the eastward of Point Latina is Point Roche, which has a shoal off it extending one quarter of a mile out.

LITTLE PLACENTIA HARBOR runs in to the southward from Point Roche, and S. E. by E. ½ E. from Point Roche, distant 2 miles, is the opposite, or Fox's Point, which may be considered to be the eastern entrance to Placentia Sound; on the western side of this sound is the harbor of Little Placentia, which extends W. by S. above 1½ mile, and is nearly half a mile broad; there is good anchorage in a cove on the northern shore, which you may know by the western side of it being woody; off the east point of the cove lies a shoal, stretching nearly one third across the channel; in this cove are 7 and 8 fathoms water. To the eastward an arm also runs in almost a league with deep water, but little frequented; it is called Placentia Sound. Fox's harbor is a small sandy cove, fit for boats only.

SHIP HARBOR.—From Point Latina to Ship Harbor the course and distance is east nearly 7 miles; this inlet runs up northerly two miles and three quarters, and is ½ a mile wide; the best anchorage is in a cove on the west side, in 10 fathoms water, about one mile from the entrance.

FOX ISLAND is small and round, and lies N. E. ½ N., distant 3 miles from Point Latina, and N. W. by W. full 3 miles from Ship Harbor Point; this latter is a low stony point, lying a mile and a quarter from the entrance of the harbor; between Fox's Island and Ship Harbor Point, is a ledge of rocks, which, in bad weather, will show beakers quite across; between the rocks are 2½, 5, 7, and 10 fathoms water. N. N. W. one mile and a half from Fox's Island is the Fishing Rock, a steep rock always above water; and N. N. E. one mile and a half from the Fishing Rock is Rowland's Sunken Rock, over which the sea most commonly breaks.

THE RAM ISLANDS.—This is a cluster of high islands, lying nearly N. E. ¾ E. from Fox Island, distant 3 miles; on the eastern side of these islands is Long Harbor;

there is no danger in entering this place, but the best anchorage will be on the northern side, to the eastward of Harbor Island, between it and the main, in 6 or 7 fathoms water, where you will ride secure from all winds.

From Long Harbor the shore runs N. N. E., N. by E. and N., full 15 miles, having no harbor or place fit for the reception of vessels, until you reach Little Harbor, Little South Harbor, and Great South Harbor; within this space are said to be several low islands and rocks; one of which, called the White Rock, from being covered with the dung of birds, lies N. E. by N. from Point Latina, distant 13 miles, and direct midway between Fox Island and Little Harbor; it is abreast of a small place, called Tinny Cove, and full 2 miles off the land: vessels pass on either side.

LITTLE HARBOR has very bad anchorage, and is much exposed to S. Westerly winds; therefore not much frequented.

LITTLE SOUTH HARBOR lies one mile to the N. Westward of Little Harbor, and has several rocky islands at its entrance, which, in sailing in, must be left on your starboard side, excepting one, on either side of which there is a good passage, with 15 fathoms water: on the southern shore within these islands is a sunken rock, over which the sea commonly breaks; it lies about a cable's length from the land. Nearly opposite are also some rocks, half a cable's length from the shore, which appear at half ebb; this harbor is one mile and a half long, half a mile wide, and has 7, 8, 10, and 12 fathoms water in it; and the ground, except where these rocks are situated, tolerably good.

GREAT SOUTH HARBOR lies one mile to the northward of Little South Harbor; its entrance is between the middle point and the Isle au Bordeaux, one mile and a quarter wide, with from 20 to 30 fathoms water; there is no danger in going in, and the anchorage one mile and a half up, or near the head of the harbor, is very good in 6 and 7 fathoms water.

CHANCE HARBOR.—The Isle au Bordeaux is a high round island, from which the coast runs N. Easterly 4 miles, to the entrance of an inlet, called Come by-Chance; this runs up full three miles, and has from 20 to 3 fathoms water, gradually decreasing in depth unto the further end; vessels may anchor here on a sandy bottom, but they will be quite exposed to S. Westerly winds.

NORTH HARBOR.—About N. N. W. 3 miles from the entrance of Come-by-Chance, is that of North Harbor; it is above a mile wide, and there is no danger in sailing into it, but like the former, it is too open to be trusted to; there is, however, fair anchorage about 2 miles up, in 7 fathoms water.

PIPER'S HOLE.—N. W. by N., distant 2½ miles from the entrance to North Harbor, is that which leads to Piper's Hole; the channel in it is between Sound Island and the main; in the passage you will have 19, 15, and 12 fathoms, and when to the northward of the island 8, 7, and 6, fathoms; from hence Piper's Hole runs up to the northward full five miles; but the water is shallow and unfit for shipping. From Piper's Holel, in a S. W. direction, lie Sound, Woody and Barren Islands, having a channel between them and the N. Western shore half a mile wide, in which are from 7 to 20 fathoms, and good anchorage all the way; between Woody and Sound Island is a passage with from 7 to 16 fathoms water in it; that between Woody and Barren Islands is much wider and deeper, having 40 and 50 fathoms. Opposite the northern part of Barren Island is a small cove, called La Plant, fit only for boats: Barren Island is 3½ miles in length, and one in breadth, it is high land, and at its S. Eastern part is a small cove, in which is tolerable anchorage in from 8 to 16 fathoms. N. W. by W. from the southern part of Barren Island is Gulsh, an inlet of very little importance; further S. W. are Great and Little Sandy Harbors.

GREAT SANDY HARBOR lies W. ½ S., distant 4 miles from the south end of Barren Island; to this place there is a passage between Ship Island and the main, with 7, 9, and 17 fathoms water; but the entrance to the harbor is very narrow, and much encumbered with rocks; these are all above water, and have channels between them, but when you get within the harbor there are 6 and 7 fathoms, and good shelter.

LITTLE SANDY HARBOR is a quarter of a mile to the southward of the Great Harbor; in it you will have 6 and 7 fathoms water, good ground; in sailing in, you should pass to the northward of a low rock, which lies at the entrance. You may readily know this harbor by the Bell Island, which lies S. E. ½ E. one mile and a half from the mouth of it, and N. E. by N. 13 miles from the western point of Merasheen Island; this island has a remarkable appearance, resembling a bell with the bottom upwards.

CLATISE HARBOR, &c.—S. W. by S. from Bell Island lie the Burgoe Islands, and farther south, the White Islands. S. W. by W. from the Burgoe Islands, nearly 5 miles, is the entrance to Clatise Harbor, between the great Isle of Valen and the main; the shore all along from the Sandy Harbors is steep to, and the passage to Clatise three-quarters of a mile wide, with 40 and 50 fathoms water; but the cove itself is very narrow; the best anchorage is in the western branch, which is a mile long, in from 10 to 17 fathoms, good ground: there is also a good channel from the southward, between Great and Little Valen Islands and the main, with 20, 30, and 50 fathoms in it.

GRAMMER'S ROCKS.—These are a cluster of low rocks, just appearing above water,

and lying E. by N. ½ N. 1½ mile from the northern end of Valen Island; there is a passage between Great and Little Valen Islands, but it is encumbered with several rocks.

MERASHEEN ISLAND.—This is a long narrow island, running nearly in the direction of the coast full 6 leagues; off its northern shores are a large cluster of rocks and islands, denominated the Ragged Islands. At its south-western part is a small but good harbor, with from 6 to 10 fathoms water in it: to sail into this place, you should keep the starboard shore on board, in order to avoid a sunken rock that lies a cable's length off a ragged rocky point on the larboard side when going in. There is also a small cluster of rocks lying off the south-eastern part of Merasheen, three-quarters of a mile from shore; these lie between it and Red Island.

RED ISLAND is high, being visible 11 or 12 leagues, and wears a barren appearance, about 4½ miles long, and 2½ broad; its southern point bears N. N. W., distant 11 miles from Placentia Road, and E. by N. 16 leagues from Mortier Head. On the eastern side of the island, and near its northern end, is a small cove or bay, fit only for small craft.

LONG ISLAND.—Directly N. E. from Red Island, distant 7 miles, lies the main body of Long Island, and mid-way between them is Woody Island, off the S. W. of which are two small rocks above water; the passage between Red and Woody Islands is otherwise clear from dangers, and nearly 3 miles wide; that between Woody and Long Islands is 2 miles across; both have deep water. Long Island is irregularly shaped, and indented with inlets; its length is full 8 miles, its breadth nowhere much above one; off its southern end is Iron Island, and a small rock above water; the southern point being formed of high and steep rocks. From Point Latina to this end of Long Island, the course and distance are N. ½ E. 4½ leagues, and from thence to Indian Harbor, which is situated on the eastern side of Merasheen Island, N. W. by W. 4 miles; to enter this place you may go on either side of a small island at the entrance; the passage is safe, but the only anchorage is to the westward of the island, between it and Merasheen, and here the ground is uncertain.

HARBOR BUFFET.—On the eastern side of Long Island, about a league from Iron Island, is Harbor Buffet, a tolerably good harbor, the entrance to which is narrow, but has 13 fathoms water in it; this place may be known by the islands that lie in the mouth and to the southward of it, and by Harbor Buffet Island, which lies E. ½ S. one mile from the entrance; to sail into this harbor, you must steer to the northward of the islands at its mouth, and being within them, you will perceive the harbor divide into two branches, one running westward, the other northward. The best anchorage is in the northern arm, in 15 fathoms water.

MUSCLE HARBOR.—On the western side of Long Island, and about 4 miles from its southern end, is Muscle Harbor, the entrance to which is between a low green point on the starboard side and a small island on your larboard; the harbor is nearly 2 miles long, and 1 broad, and has from 10 to 20 fathoms water within it. Vessels bound to this place may run in between Woody and Iron Islands from the southward, or between Long and Merasheen Islands from the northward; but in the latter track there are some rocks to be guarded against, which lie nearly mid-channel between the northern ends of both islands; there are also some rocks above water, to the north-eastward of Long Island, called the Bread and Butter Islands; but these are always visible, and steep to.

PRESQUE.—W. N. W. ¾ N., distant 4 miles from the south-western point of Merasheen Island, lies the little harbor of Presque; the water here is sufficiently deep, but there are so many rocks about its entrance, that it is rendered thereby difficult of access. S. W. ½ W., two miles from Presque, is the Black Rock, and a quarter of a mile within this is a sunken rock. West from the Black Rock, distant 2 miles, is the Island of Marticot, about one mile in length, and half a mile broad; within the Black Rock and Marticot Island lie the Harbors of La Perche and Little and Great Paradise.

LA PERCHE runs in to the northward of the Black Rock; its entrance is difficult, and there is no good anchorage. Little Paradise lies to the westward of La Perche, and to the northward of the east point of Marticot Island; the only safe anchorage is in a cove, at the head of the harbor, on the larboard side; there you may moor to the shore, and lie land-locked. Great Paradise is fit only for boats; it lies to the westward of Little Paradise. Between the north-western point of Marticot and the main is Fox Island; between these islands is a safe passage into Paradise Sound, with 9 fathoms; but vessels must never attempt going between Fox Island and the main.

PARADISE SOUND.—To the westward of Fox Island, about 1 mile, is the entrance to Paradise Sound, extending N. E. by E. 4 leagues, and being about a mile broad, having very deep water throughout, and no safe anchorage, except at its head. Just within the sound, on its eastern side, is a cove, with 10 fathoms water; but there are several rocks above water in it, and the bottom is rocky, so that you cannot well anchor there. In passing to the north-westward of Fox Island, there is a sunken rock, which must be avoided. To the south-westward of Paradise Sound lies Long Island, running W. S. W. ½ S. about 3½ miles; it is principally high land, making in several peaks.

PETIT FORT HARBOR.—One mile to the westward of Paradise Sound lies Petit

Fort Harbor, a very good inlet, having in it from 14 to 7 fathoms water, good ground. The entrance is more than a quarter of a mile wide, and lies N. E., distant 5 miles from the south point of Long Island, and N. by E. 2½ miles from the north point of the same. There is no danger in going in; and the best anchorage is on the starboard or eastern side, for S. E. winds heave in a great swell on the western shore, when it blows hard. Nonsuch Harbor has no good anchorage.

CAPE ROGER HARBOR lies close to the westward of Cape Roger, which is a high round barren head, lying N. ¼ E. 3½ miles from the south point of Long Island. There are several low rocks and islands lying off the eastern point of the entrance. In the harbor, at a quarter of a mile within, on the western side, lies a small island, to the northward of which, between it and the main, is a very good anchorage in 7 or 8 fathoms water, or farther up in 6 or 7 fathoms.

GREAT GALLOWS HARBOR.—N. N. W., 2 miles from the south point of Long Island, lies a small green island, which has a shoal all round to nearly a cable's length. From Green Island, N. N. W. 2½ miles, lies Great Gallows Harbor Island, which is high. Vessels may pass on either side of this island into Great Gallows Harbor, which lies one mile to the E. N. E. of the island. In this harbor is exceedingly good anchorage in 7 fathoms water, on the starboard side, just within a low stony point, taking care to give the point a small berth, in order to avoid a rock which is alternately covered and uncovered with the tide.

LITTLE GALLOWS HARBOR lies close round to the eastward of Great Gallows Harbor, and is only fit for small vessels, which must be moored to the shore; a rock above water lies at the entrance, and the two harbors are only divided by a narrow neck of land. To the north-westward of Great Gallows Harbor are Little Harbor, Bay de L'Eau, and Boat Harbor; the first of these is only fit for boats; Bay de L'Eau runs in a full league, and has deep water all the way up, except at its head, where there appears a sandy beach. Here vessels may ride in 3 fathoms.

BOAT HARBOR lies round the western point of Bay de L'Eau, off which is a rock above water; this harbor runs up N. E. 3 miles, with deep water, until you get near its further end. The land from hence runs south-westward to Bane Harbor; this lies on the main land, and is fronted by several islands, the largest of which is called Cross Island, being two miles in length, and one in breadth; the other islands are named Gooseberry, Petticoat, Gull and Jerseyman's Islands, and are situated between Cross Island and the main.

BANE HARBOR is a good place for small vessels; its entrance is narrow, but when you are within it, there is sufficient room to moor with 3 fathoms water. There are good channels between all these islands, through which vessels may pass to the harbors at the northward. One mile and three-quarters S. W. from Bane Harbor is Rashoon, too shallow for any vessels; and about the same distance from Rashoon is Broad Cove; here the anchorage is exceedingly good, with 8 and 9 fathoms water; it lies to the north-eastward of a point of land, which juts out, and is named Broad Cove Head.

RED HARBOR lies 3 miles from Broad Cove Head, and is a good harbor, but too open to the southward; in it are 17, 13, and 9 fathoms; S. W. from hence, distant 3½ miles, and situated on the main, is John le Bay; in your passage to which, and nearly mid-channel, between Flat Islands and the shore, is a cluster of small islands, with deep water all round them; and further on, near the land, is a rock above water; you may sail on either side of this; the channel between it and the land is narrow, and has 17 fathoms; that on the eastern, or outside, has 18, 25, and 26 fathoms, and leads directly out to Placentia Bay.

AUDIERNE ISLAND lies half a mile to the northward of Cape Jude, or Middle Island, on the west side of which there is a tolerably good harbor. At about a cable's length from Audierne Island, to the southward of the harbor, is a sunken rock, the mark for avoiding which, in coming in from the southward, is not to haul in for the harbor till you open a remarkable green point on the southern side of the harbor. The best anchorage is on the north shore, just within a small island. A spit of rocks stretches just off the green point on the south shore, which is covered at high water.

Vessels bound for Audierne Harbor may pass between Cape Jude, or Middle Island, and Audierne Island, and between Crow and Patrick's Islands, which are two small islands lying off the S. W. point of Audierne Island. Off the eastern point of Audierne is Ford's Island, to the west of which is a sunken rock, about a cable's length from the island, and another on the eastern side, which almost always breaks. W. by N. about 1½ mile from Ford's Island is Green Island, having a little rocky islet off its eastern, and another off its western end; there is deep water all round it, 11 fathoms close to the rocky islets, 70 fathoms between it and Ford's Island, 73 and 63 fathoms between it and Long Island, and still deeper water towards the Gallows Harbors.

THE SADDLE BACK is an islet lying E. N. E. 8½ leagues from Corbin Head; E. by N. from Mortier West Point, and E. ¾ S. 3 leagues from John the Bay Point. Between it and the main are a great number of rocks and little islands, which render this part of the coast very dangerous. A chain of rocks extends N. E. by E. 2 miles from the Saddle Back.

CAPE JUDE, or MIDDLE ISLAND, is about 2½ miles in length, 2 in breadth, and

lies 1½ mile north of the Saddle Back; on the south end of it is a round hill, which is called the Cape. Between this island and the main are a cluster of islands and low rocks with a great number of sunken rocks about them, called the Flat Islands, the innermost of which lies about one mile from the main.

West 3¼ miles from the south-eastern Flat Island, and 2 miles to the N. N. W. of John the Bay Point, lies John the Bay, in which there is tolerably good anchorage, with about 8 fathoms water, sandy bottom.

ROCK HARBOR.—From John the Bay Point to Mortier East Head, the bearing and distance are S. W. ¼ W. 8 miles. Two miles S. W. by W. from John the Bay Point lies Rock Harbor, not fit for shipping. Between lie two sunken rocks, nearly half a mile from the shore.

MORTIER BAY.—Two miles W. S. W. from Rock Harbor is the opening into Mortier Bay, at the western entrance of which is a small harbor, called Boboy, of only 9 feet water. The course into Mortier Bay is N. N. E. for about 2 miles; and in it there are from 50 to 70 fathoms water, the land on each side being high; it then extends westward about 2 miles, and is nearly 2 miles wide. On the eastern side, at about 3 miles from the entrance, is an exceedingly good harbor, called Spanish Room, in which vessels may anchor in from 4 to 6 fathoms water, good ground, and secure from all winds. There is not the least danger in going into this harbor, only giving the low rocks above water, on the larboard hand at the entrance, a berth of one cable's length.

LITTLE MORTIER BAY.—Two miles and a half from the entrance of Mortier Bay lies Crony Point and Islands; about 2 miles further southward, and nearly a mile westward of Mortier East Point is Little Mortier Bay, at the entrance of which is a round island, called Mortier Island, lying one-third of the distance from the west side; it is bold to all round, and may be passed on either side. Close to the first point beyond the island, on the larboard side going in, is another little island, close under the land; and two cables' length from it, in a direct line towards the outer island, is a sunken rock, on which the sea breaks in bad weather, which is the only danger in the bay. At the bottom of it, 1½ mile from Mortier Island, on the east side, is a cove, called Fox Cove, where there is fair anchorage, and room for one ship to moor in 9 fathoms, good holding ground, two points open to the sea, from S. S. E. to S. E. On the west side of the bay is the harbor, which is small and narrow, but a very good one for small ships, where they lie moored to the shore. Off the starboard point, going in, is a rock, which is always covered at high water.

One mile and a half S. W. by W. from Mortier East Point lies Mortier West Head, one mile beyond which is Iron Island; and S. E. ½ E. 2 leagues from Iron Island, and S. W. ¼ W., 5 leagues from Cape Jude, lies the Mortier Bank, the shoal part of which is about one league over, and on which there are said to be only 4 fathoms. The sea breaks heavily on it in blowing weather.

IRON ISLAND is small and high; off its S. W. point is a rock under water; three-quarters of a mile to the southward of it is Gregory's Rock, S. ½ W. ⅓ of a mile from which is Galloping Andrews; and S. E. by E. from Iron Island is the White Horse of 8 fathoms: a W. S. W. course from Marticot's Island will clear all these dangers.

GREAT AND LITTLE BURIN HARBORS.—S. W. ½ W. from Iron Island, distant one league, is the S. E. point of Great Burin Island; and W. N. W. 1½ mile from it is the north part of Pardy's Island. On the main, within these islands, lie the harbors of Great and Little Burin. Vessels bound for Burin may pass on either side of Iron Island; the only danger in passing to the northward is the ledge called the Brandys, which almost always breaks; they lie near a quarter of a mile to the southward of a low rock, above water, close under the land of Mortier West Head. By keeping Mortier West Head open to the westward of Iron Island, you will avoid Gregory's Rock, on which are only 2 fathoms water, and which almost always breaks. Vessels may pass with safety between this rock and Iron Island, by giving the latter a berth of above a cable's length.

GALLOPING ANDREWS.—On the main, within Pardy's Island, are two remarkable white marks in the rocks; the northernmost of these brought on with the north part of Pardy's Island, and Iron Island N. E. ½ N., will lead on the Galloping Andrews, a shoal with 5 fathoms water on it.

The White Horse is a shoal with 8 fathoms on it, which bears S. E. by E. one mile from Iron Island.

The Dodding Rock lies about a quarter of a mile from the easternmost part of Great Burin Island.

Great Burin Island is about 2½ miles in length, lying N. N. E. and S. S. W., being high land; near its south end is Cat Island, high and round, lying E. N. E. nearly 4 miles from Corbin Head.

From Corbin's Head to Shalloway Point the bearing and distance are N. E. ½ N, 4½ miles. Between them, and nearly in the same direction, lie Corbin and Little Burin Islands, both high and round, not more than a cable's length from the shore.

SHALLOWAY ISLAND lies N. N. W. ½ W. one mile from Cat Island, and N. E. by E. a quarter of a mile from Little Burin Island: the passage into Burin Harbors, from the southward, is to the westward of Shalloway Island.

In sailing in, take care to give Poor Island a berth on your larboard hand, and when within Shalloway Island, you may anchor in safety between it and Great Burin Island, in from 12 to 18 fathoms. The best anchorage in Great Burin Harbor is in Ship Cove. The course up to it, after you are within Neck Point, which is to the westward of the Shalloway Island, is N. N. E. about one mile. It is nearly a quarter of a mile wide. In sailing up, keep the west shore on board, in order to avoid a sunken rock on the east shore, at about half way up, and near a cable's length from the shore. Directly off this is a remarkable hole in the rock, on the same side, and a gully in the land from top to bottom, on the western shore. Another rock, with 2 fathoms on it, lies above a cable's length to the S. W. of Harbor Point, which is round and green, and of a moderate height, joined to Great Burin Island by a low, narrow, sandy neck.

BURIN BAY is about one mile N. N. E. of Little Burin Island; it is clear, and about a mile wide every way: here ships may occasionally anchor, and lie almost land-locked. In this bay are two islands, one called Poor Island, low and barren; the other lies to the northward, before the entrance of Burin Inlet, and is high and woody.

BURIN INLET may be entered on either side of the island; it extends up 5 miles; a little within the entrance, on the east side, half a cable's length from the shore, is a rock covered at three-quarter's flood; and $1\frac{3}{4}$ mile from the entrance, near the middle, is another rock, to the westward of which is good room and fair anchorage, in from 7 to 12 fathoms. There are 15 fathoms in the entrance, and in the middle, 2 miles up, 15 to 23 fathoms; and thence up to the head are from 10 to 5 fathoms.

The east passage in is between Pardy's Island and Iron Island; but is not safe without a commanding gale, and that between the N. N. E. and S. E.

CORBIN HARBOR is about a mile to the northward of Corbin Head, and is a good harbor for small vessels. A quarter of a mile eastward from this harbor, and 2 cables' length from the shore, is a sunken rock, of 5 or 6 feet water, on which the sea breaks in bad weather. Vessels bound for this harbor must also avoid a shoal of 2 fathoms water, which lies E. S. E. from the south point of the entrance, distant half a mile; the best anchorage is in the north arm, about half a mile within the entrance, opposite a cove on the starboard side.

From Corbin Head, which is high bluff land, to Small Point, the lowest hereabout, the course and distance are W. S. W. $2\frac{1}{2}$ miles; and from Small Point to Sauker Head, W. $\frac{1}{2}$ S. 2 miles: there are many head-lands between, which form coves, but afford no shelter. The coast is clear of rocks; and there are 30 fathoms water close to the shore; but a little to the S. Westward of Sauker Head there is a small rock under water; it lies close in with the land.

From Sauker Head, which is a high hill in the shape of a sugar loaf, to Cape Chapeau Rouge, the bearing and distance are west, 3 miles; between lie the harbors of Great and Little St. Lawrence.

LITTLE ST. LAWRENCE.—The harbor of Little St. Lawrence is the first to the westward of Sauker Head. To sail in, you must keep the west shore on board, to avoid a sunken rock, which lies a little without the point of the peninsula, which stretches off from the east side of the harbor. The anchorage is above the peninsula, (which shelters it from the sea-winds,) in 3 or 4 fathoms water, a fine sandy bottom. Ships may anchor without the peninsula, in 12 fathoms, good ground; but this place is open to S. S. E. winds.

GREAT ST. LAWRENCE.—The harbor of Great St. Lawrence, which is the westernmost, is close to the eastward of Cape Chapeau Rouge. To sail in, you should be careful with westerly, particularly with S. W. winds, not to approach too near the Hat Mountain, in order to avoid the flaws and eddy winds under the high land. There is no danger but what is very near the shore. The course in is, first, N. N. W. till you open the upper part of the harbor, then N. $\frac{1}{2}$ W. The best anchorage for large ships is before a cove, on the east side of the harbor, in 13 fathoms water. A little above Blue Beach Point, which is the first on the west side, you may lie, only having two points open; and may anchor any where between this point and the point of Low Beach, on the same side, near the head of the harbor, observing that, close to the west shore, the ground is not so good as on the other side. Fishing vessels commonly lie at the head of the harbor above the beach, sheltered from all winds.

Garden Bank, whereon are from 7 to 16 fathoms water, lies about half a mile off Little St. Lawrence, with Blue Beach Point on with the east point of Great St. Lawrence.

FROM CHAPEAU ROUGE TO CAPE RAY.

FERRYLAND HEAD lies W. S. W. one mile from Cape Chapeau Rouge; it is a high rocky island, just separated from the main, and with Chapeau Rouge, are infallible objects to point out the harbors of St. Lawrence.

LAUN BAY.—W. N. W., 8 miles from Ferryland Head, lies the Point of Laun, from whence the land turns to the northward, and forms the Bays of Laun; here are two small inlets, called Great and Little Laun. Little Laun is the easternmost, lies open to the S. W. winds, and therefore is no place to anchor in. Great Laun runs in N. E. by N. 2 miles; is near half a mile wide, and has from 14 to 3 fathoms water. In sailing in be careful to avoid a sunken rock, which lies about a quarter of a mile off the east point. The best anchorage is on the east side, about half a mile from the head, in 6 and 5 fath-

oms, tolerably good bottom, and open only to the S. and S. by W. winds, which cause a great swell, as the head of this place is a bar harbor, where boats can ascend at half tide, and find conveniences for fishing, with both wood and water.

LAUN ISLANDS lie off the west point of Laun Bay, not far from the shore; the westernmost and outermost of which lies W. N. W., westerly, 14 miles from Ferryland Head. Nearly a quarter of a mile to the southward of this island is a rock, whereon the sea breaks in very bad weather; there are other sunken rocks about these islands, but not dangerous, being very near the shore.

TAYLOR'S BAY lies open to the sea, about four miles to the westward of Laun Islands. Off the east point are some rocks, near a quarter of a mile from the shore.

POINT AUX GAUL is a low narrow point of land, which stretches out a little to the westward of Taylor's Bay: a rock lies off it above water, half a mile from the shore, called Gaul Shag Rock, which bears from Ferryland Head W. N. W. $\frac{3}{4}$ W. $6\frac{1}{2}$ leagues: there are 14 fathoms close to the offside of it, but some rocks on its inside. From Point Aux Gaul Shag Rock to the Lamelin Islands, the bearing and distance are N. W. by W. one league; between is the Bay of Lamelin, which is unfit for shipping, being shallow, and having several islands and rocks about it; the river at the bottom of the bay abounds with salmon.

Near the south point of the westernmost Lamelin Island is a rock high above water, called Lamelin Shag Rock. From Lamelin Shag Rock to Point May, the distance is 9 miles; between lie the Lamelin Ledges, which are very dangerous, some of them being 3 miles from the land. To avoid them, in the day time, you should not bring the Lamelin Islands to the southward of E. S. E. until Point May bears N. E. by N. from you; you may then steer northward between Point May and Green Island with safety. By night, approach no nearer than in 30 fathoms water.

REMARK.—Mariners who navigate this part of the coast, will do well by observing the appearance of the land, for all that part of Chapeau Rouge and Laun is very high and hilly close to the sea; from Laun Islands to Lamelin, it is only moderately high; and from Lamelin to Point May, the land, near the shore, is low, with beaches of sand, while inland it becomes mountainous.

ST. PIERRE, or ST. PETER'S ISLAND.—The island of St. Pierre lies 13 leagues W. by N. from Cape Chapeau Rouge; it is about 4 leagues in circumference, and pretty high, with a craggy, broken, uneven surface. On coming from the westward, Point Cronier, which is the S. E. point of the island, makes in a round hummock, like a small island, separated from St. Pierre. A little to the N. E. of Point Cronier lie three small islands, the innermost of which is the largest, and called Dog Island; within it are the road and harbor of St. Pierre. The harbor is small, and has from 20 to 12 feet water; but there is a bar across the entrance, with only 6 feet at low water, and 12 or 14 at high water. The road lies on the W. side of Dog Island, and will admit ships of any burthen in 8, 10, or 12 fathoms water. The best anchorage is on the north side; but in general it is rocky, and exposed to the N. E. winds. Be cautious, in going in or out, of some sunken rocks, which lie about a mile E. S. E. from Boar Island, which is the easternmost of the three islands above mentioned: this is the only danger about St. Peter's, but what lies very near the shore.

On Cannon Point, the north side of the entrance to the inner harbor, there is a lighthouse containing a fixed light, which is lit from the 1st of May to the 15th of November; with this light bearing W. by N., or W. $\frac{1}{2}$ N. about 2 cables' length distant, there is anchorage in $5\frac{1}{2}$ and 6 fathoms water.

THE ISLAND OF COLOMBIER lies very near to the N. E. point of St. Pierre; it is rather high; between them is a passage one-third of a mile wide, with 12 fathoms water. On the north side of the island is a rock, called little Colombier; and about one-quarter of a mile E. N. E. from it is a sunken rock, with 2 fathoms on it.

GREEN ISLAND is about three-quarters of a mile in circuit, and low; it lies E. N. E. about 5 miles from St. Pierre, and nearly in the middle of the channel, between it and Point May, in Newfoundland; on its south side are several rocks above and under water, extending $1\frac{1}{4}$ mile to the W. S. W.

LANGLEY, or LITTLE MIQUELON.—Langley Island lies to the N. W. of St. Pierre, with a passage of about $2\frac{1}{2}$ miles wide between, free from danger. It is about 8 leagues in circuit, of a moderate and equal height, excepting at the north end, which is a low point, with sand hills; off which, on both sides, it is a flat a little way; but every other part of the island is bold to. There is anchorage on the N. E. side of the island, near Seal Cove, in 5 or 6 fathoms, a little to the southward of the sand hills, on a fine sandy bottom.

GREAT MIQUELON.—From the north point of Langley to the south point of Miquelon, the distance is scarcely one mile, and the depth of water between is 2 fathoms. Miquelon is 4 leagues in length from north to south, and is about 5 miles in breadth at the widest part: the middle of the island is high land, called the High Lands of Dunne; but down by the shore it is low, excepting Cape Miquelon, which is a lofty promontory at the northern extremity of the island.

On the S. E. side of the island is the little Harbor of Dunne; it is a bar harbor, admitting fishing shallops at half flood, but no way calculated for shipping.

Miquelon Rocks stretch off from the eastern point of the island, under the high land, $1\frac{1}{4}$ mile to the eastward; some are above, and some under water; the outermost are above water, and there are 12 fathoms water close to them, with 18 and 20 a mile off. N. E. $\frac{1}{2}$ E. about $4\frac{1}{2}$ miles from these rocks, lies Miquelon Bank, on which are 6 fathoms water.

Miquelon Road, which is large and spacious, lies towards the north end, and on the east side of the island, between Cape Miquelon and Chapeau, which is a very remarkable round mountain near the shore, off which are some sunken rocks, at the distance of about a quarter of a mile; but every where else it is clear of danger. The best anchorage is in 6 or 7 fathoms, near the bottom of the road, on fine sandy bottom; but there you lie exposed to easterly winds.

The Seal Rocks, two in number, are above water, and lie about $1\frac{1}{2}$ league off from the north-west side of Miquelon; the passage between them and the island is very safe, and there are 14 or 15 fathoms water within a cable's length, all round them.

Point May has a rocky islet at its point, and from thence the land turns N. N. E. towards Dantzick Cove and Point, and thence E. N. E. towards Fortune Head.

FORTUNE BAY, &c.—From Point May to Pass Island, the bearing and distance are N. $\frac{1}{2}$ E. 12 leagues: between them is the entrance to Fortune Bay, which is about 22 or 23 leagues deep; and in which are numerous bays, harbors, and islands.

BRUNET ISLAND.—The Island of Brunet lies nearly in the middle of the entrance into Fortune Bay; it is above 5 miles in length, two in breadth, and of moderate height; the eastern part appears, in some points of view, like islands; on its east side is a bay, wherein there is tolerable anchorage for ships, in 14 or 16 fathoms water, sheltered from southerly and westerly winds. In the bottom of the bay, at about a quarter of a mile from the shore, are some rocks, which must be avoided. Opposite to this bay, on the south-west side of the island, is a small cove, with 6 fathoms water. The islands lying off the west end of Brunet, to the southward, are called the Little Brunets, which, with Brunet, may be approached within a quarter of a mile all round.

The Plate Islands are three rocky islets, of a moderate height, the nearest of which lies W. S. W. one league from the west end of Great Brunet. The southernmost is about 2 miles farther off, and bears from Cape Miquelon E. $\frac{1}{2}$ S. $3\frac{3}{4}$ leagues; and in a direct line between Point May and Pass Island, 17 miles from the former, and 19 miles from the latter. E. S. E., a quarter of a mile from the Great Plate, (which is the northernmost,) is a sunken rock, whereon the sea breaks, and this is the only danger about them. There are several strong and irregular settings of the tides or currents about the Plate and Brunet Islands, which seem to have no dependency on the moon, and the course of the tides on the coast.

SAGONA ISLAND, which lies N. E. 2 leagues from the east end of Brunet, is about a mile across each way, of a moderate height, and bold to all round; on its western side there is a small creek, admitting fishing shallops; in the middle of the entrance to this, is a sunken rock, which occasions it to be difficult of access, except in very fine weather; a sand bank surrounds this island, running westerly full 7 miles, upon which are 14, 17, and 20 fathoms water.

POINT MAY is the southern extremity of Fortune Bay, and the S. W. extremity of this part of Newfoundland; it may be known by a great black rock, nearly joining to the pitch of the point, and something higher than the land, which makes it look like a black hummock on the point. At about a quarter of a mile directly off from this black rock are three sunken rocks, on which the sea always breaks.

DANTZIC COVES.—N. by E. $1\frac{3}{4}$ of a mile from Point May, is Little Dantzic Cove; and 2 miles farther is Great Dantzic Cove. From Dantzic Point, (which is the north point of the Coves,) to Fortune Head, the bearing and distance are E. N. E. $2\frac{1}{4}$ leagues; and thence to the town of Fortune, $1\frac{1}{2}$ mile S. E. by E. This is a fishing village, and the road where the ships lie has from 6 to 10 fathoms water, quite exposed to nearly half the compass: it lies S. by W. from the east end of Brunet. To the N. N. Westward of Dantzic Point is the long narrow bank of Jerseyman's, with 24 and 25 fathoms over it, extending from abreast of the point in the direction of the Plate Islands.

SHIP COVE.—The Cape of Grand Bank is high, and lies one league E. N. E. from Fortune. To the eastward of this cape is Ship Cove, where there is good anchorage for shipping in 8 or 10 fathoms water, sheltered from south, west, and north-westerly winds. Grand Bank lies S. E. half a league from the cape, and is a fishing village, where there is no security for shipping, and the entrance is barred.

From the cape of the Grand Bank to the Point Enragée, the course is E. N. E. $\frac{1}{4}$ E. distant 8 leagues; the coast between forms a circular bay, in which the shore generally is low, with several sandy beaches, behind which are bar-harbors, fit only for boats, of which the principal is Great Garnish, lying $4\frac{1}{2}$ leagues from the cape of Grand Bank; it may be known by several rocks above water, lying before it at two miles distance from the shore; the outermost of these is steep to; but between them and the shore are several dangerous sunken rocks. To the eastward, and within these rocks, is Frenchman's Cove, where small vessels sometimes run in and anchor in 4 or 5 fathoms water, tolerably well sheltered from the sea winds: this is a convenient place for the cod fishery; the passage

in is to the eastward of the rocks that appear the highest above water; between them and some other lower rocks lying off to the eastward of the east point of the cove, there is a sunken rock nearly in the middle of the passage, which you must be aware of. The shore is bold all the way from Point May to Cape of Grand Bank, there being 10 or 12 fathoms within 2 cables' length, and 30 or 40 at a mile off: between the latter and Great Garnish the water is not so deep, and ships may anchor any where in 8 or 10 fathoms water, sheltered only from the land-winds.

From Point Enragée to the head of the bay, the course is, first, E. N. E. ¼ E. 3 leagues to Grand Jervey; then E. ¾ N. 7½ leagues to the head of the bay: the land in general along the south side is high, bold to, and of uneven appearance, with hills and valleys of various extent, the latter mostly covered with wood, and having many fresh water rivulets.

BAY L'ARGENT.—Seven leagues to the eastward of Point Enragée is the Bay L'Argent, where there is anchorage in 30 or 40 fathoms water, sheltered from all winds.

HARBOR MILLE'.—The entrance to Harbor Millé lies to the eastward of the east point of L'Argent. Before this harbor, and the Bay L'Argent, is a remarkable rock, which, at a distance, appears like a shallop under sail. Harbor Millé branches into two arms, one lying to the S. E., the other to the east; at the upper part of both are good anchorages. Between this harbor and Point Enragée are several bar-harbors, or small bays, with sandy beaches: but the water all along the coast is very deep; you may safely anchor any where, but it must be very near the shore.

Cape Millé lies N. E. ½ E. one league from the Shallow Rock above mentioned, and near 3 leagues from the head of Fortune Bay; it is a high, reddish, barren, rocky point. The width of Fortune Bay at Cape Millé does not much exceed half a league; but immediately below, it becomes twice as wide, by which the cape may readily be known; and above this cape the land on both sides is high, with steep craggy cliffs. The head of the bay is terminated by a low beach, behind which is a large pond, or bar-harbor, fit only for boats. In this, and in all the bar-harbors between this and the Grand Bank, are convenient places for building stages, and good beaches for drying fish, fitted to accommodate numerous boats.

GRAND LE PIERRE is a good harbor, situated on the north side of the bay, half a league from the head. The entrance cannot be seen until you are abreast of it; there is no danger in going in, and you may anchor in any depth, from 8 to 4 fathoms, sheltered from all winds.

ENGLISH HARBOR lies a little to the westward of Grand Pierre; and to the westward of English Harbor is the Little Bay de L'Eau, both of which are small, and only fit for boats.

NEW HARBOR is situated opposite to Cape Millé, and to the westward of the Bay de L'Eau; it is a small inlet, and has good anchorage on the west side, in from 8 to 5 fathoms, sheltered from S. W. Winds.

THE HARBOR FEMME lies half a league to the westward of New Harbor, it is narrow, and has in it 20 and 23 fathoms; before its entrance is an islet, near to which are some rocks above water; one league to the westward of Harbor Femme is Brewer's Hole, fit only for boats; before this cove is also a small island near the shore, and some rocks above water.

HARBOR LA CONTE is situated one mile to the westward of Brewer's Hole; before this are some islands, the outer one is called the Petticoat Island, the inner Smock Island; there are also two smaller ones between these, and a sunken rock or two; the best passage in is on the west side of the outer island, and between the two larger ones; so soon as you begin to open the harbor, keep the inner island close on board, to avoid some sunken rocks that lie near a small island, which you will discover between the N. E. point of the outer island and the opposite point on the main: there is also another rock which appears at low water, and lies higher up on the side of the main; and when you get beyond these dangers, you may keep in the middle of the channel, and will soon open a fine spacious harbor, wherein you may anchor in any depth, from 6 to 16 fathoms water, on a bottom of sand and mud, shut in from all winds. To the eastward of the outer island there is a small cove, fit for small vessels and boats, and otherwise convenient for the fisheries.

LONG HARBOR lies 4 miles to the westward of Harbor La Conte, and N. E. by E., distant 5 leagues from Point Enragée. It may be known by Gull Island, which lies at its mouth, and a small rock, which lies half a mile without the island, and has the appearance of a small boat; there is a passage into this harbor on each side of this island; the western one is the broader of the two: nearly in the middle of this channel, a little outside of the island, is a ledge of rocks, whereon are two fathoms water; and a little within the island, on the eastern side, are others, 2 cables' length from the shore, they lie off two sandy coves, and are visible at low water. Long Harbor runs 5 leagues up into the country, but the only anchoring place is in Morgan's Cove, on the N. W. side of the harbor, about 2 miles within Gull Island, in 15 fathoms water, unless you run above the Narrows: there is a salmon fishery at the head of the bay.

A little to the westward of Long Harbor, is Hare Harbor, fit for small vessels only. Two miles to the northward of Hare Harbor, is Mal Bay, having very deep water,

extending north-easterly about 5 miles, and having no anchorage except at its furthest end: to the westward of Mal Bay, near the shore, lie the Rencontre Islands, the westernmost of which is the largest, has a communication with the main at low water. In and about this island is shelter for small vessels and boats.

BELLE HARBOR lies 4 miles N. W. by N. from the westernmost Rencontre Island; the passage into it is on the western side of the island, and so soon as you have passed the islands you will open a small cove, on the east side, where small vessels can anchor, but large vessels must run up to the head of the harbor and anchor in 20 fathoms, where there is most room: it is but an indifferent harbor. About 1¾ of a mile westward of Belle Harbor is Lally Cove, behind an island, fit for small vessels only; the west point of this cove is high and bluff, and is called Lally Head; to the northward of this head is Lally Back Cove, where ships may anchor in 14 or 16 fathoms water.

Two miles to the northward of Lally Cove Head, are East Bay and North Bay, in both of these there is deep water, but no anchorage near the shore; at the head of North Bay is the largest river in Fortune Bay, and appears to be a good place for the salmon fishery, from which circumstance, it is named Salmon River.

CINQ ISLES BAY.—The Bay of Cinq Isles lies to the southward of the North Bay, and opposite to Lally Cove Head; there is tolerably good anchorage for large ships on the S. W. side of the islands, in the bottom of the bay. The north arm is a very snug place for small vessels, and salmon may be caught at its head.

CORBEN BAY.—A little to the southward of the Bay of Cinq Isles is Corben Bay, where there is good anchorage, for any ships, in 22 or 24 fathoms water. About 2 miles south-eastward from Lally Cove Head are two islands, about a mile distant from each other; the north-easternmost is called Belle Island, and the other Dog Island; they are bold to all round. Between Dog Island and Lord and Lady Island, which lies off to the south point of Corben Bay, something nearer to the latter, is a sunken rock, with deep water all round it; and about a quarter of a mile to the northward of Lord and Lady Island, is a rock which appears at low water.

BANDE DE L'ARIER BAY lies on the west point of Belle Bay, and N. ½ W. 3 leagues from Point Enragée; it may be known by a very high mountain over the bay, which rises almost perpendicular from the sea, called Iron Head. Chapel Island, which forms the east side of the bay, is high land also; the harbor lies on the west side of the bay, just within the point formed by a narrow low beach, and is a snug place; between the harbor and Iron Head there is tolerably good anchorage, in 18 or 20 fathoms.

Bande de L'Arier Bank has 7 fathoms water on it, and lies with the beach of Bande de L'Arier Harbor just open of the west point of the bay, and Boxy Point on with the north end of St. Jacques Island.

ST. JACQUES.—Two miles to the westward of Bande de L'Arier is the harbor of St. Jacques, which may be readily known by the island before it being high at each end, and low in the middle. The passage into the harbor is on the west side of the island, free from danger, as is the harbor, where you may anchor in from 17 to 4 fathoms.

BLUE PINION.—About one and a half mile to the westward of St. Jacques, is the harbor of Blue Pinion; and a little to the westward of that is English Cove.

BOXY HARBOR.—Boxy Point lies W. ¾ S. 6 miles from St. Jacques Island, and E. N. E. ½ E. 12½ miles from the east end of Brunet Island; it is of moderate height, and the most advanced to the southward of any land on the coast. Boxy Harbor lies N. E. 3 miles from Boxy Point, in which there is anchorage in 4 or 5 fathoms water, fine sandy ground; to sail in, bring Boxy Point open of a little black head just within the point, called Friars Head; in this direction you will keep the middle of the channel, and between the shoals which lie off each point of the harbor where the stages are.

W. N. W., one mile from Boxy Point, is the Island of St. John; and N. N. W. half a league from St. John's Island is St. John's Head, high, steep, and craggy. Between St. John's Head and Boxy Point is St. John's Bay, quite exposed; in the bottom of this is John's Harbor, fit for boats only. On the north side of St. John's Head are two rocky islets, called the Gull and Shag; at the west end of which there are several sunken rocks.

GREAT BAY DE L'EAU is about 1½ league to the northward of St. John's Head, In this bay there is good anchorage in various depths, sheltered from all winds. The passage in is on the east side of the island, which lies in its entrance; for only very small vessels can enter to the westward.

BARRYSWAY BAY.—To the westward of Bay de L'Eau, about 3 miles north from St. John's Head, is Little Bay Barrysway; on the west side of which there is good anchorage for large ships, in 7, 8, or 10 fathoms; and both wood and water to be obtained with ease.

HARBOR BRITON lies to the westward of Little Barrysway, and N. N. E. ¼ E. 2 leagues from the Island of Sagona. The heads which form the entrance are high, and lie from each other S. E. and N. W., distant about 2 miles. Near the east head is a rock above water. The only danger in going in is a ledge of rocks, which stretches 2 cables' length from the south point of the S. W. arm, which is more than a mile within the west head. The only place for ships of war to anchor in is above this ledge, before the entrance

of the S. W. arm, in 16 or 18 fathoms, mooring nearly east and west; the bottom is very good, and plenty of wood and water is to be obtained here. Opposite to the S. W. arm is the N. E. arm, or Jerseyman's Harbor, which is capable of holding a great number of ships, secure from all winds, in 6, 7, and 8 fathoms water: it has a bar at the entrance, on which there are 3 fathoms. The mark to sail over the bar is, the point of Thompson's Beach, which is the south point at the entrance into the S. W. arm, open of Jerseyman's Head, which is high and bluff on the north side of the entrance into Jerseyman's Harbor: so soon as you open the harbor, haul up to the northward, and anchor.

From the west end of Harbor Briton to Connaigre Head the bearing and distance are W. 5 miles; between are Gull Island and Deadman's Bay, off which there is a bank stretching from the shore between 2 and 3 miles, whereon the depths vary from 34 to 4 fathoms. The sea, during storms, will sometimes break for a considerable way out from Gull Island.

CONNAIGRE BAY.—From Connaigre Head, which is high and craggy, to Basseterre Point, the bearing and distance are N. W. ¾ W. 7 miles; between is Connaigre Bay, which extends about 4 leagues inland. In the mouth of the bay lie the Connaigre Rocks, above water, which may be approached very near, there being no danger but what shows itself: the channel between them and Connaigre Head is the safest, as a ledge of rocks extends a mile from the north shore, which renders the other channel rather dangerous.

Connaigre Harbor is near 5 miles above the head, within a point on the south side of the bay; it is very small, and the depth of water is 7 fathoms; the passage in is on the S. E. side of the island, which lies before it. Abreast of this harbor, nearly in the middle of the bay, are two islands; and on the south side of the westernmost, are some rocks above water.

Dawson's Cove is on the N. W. side of the bay, and bears N. N. E. about 4 miles from Connaigre Head, and W. N. W. 2 miles from the west end of the westernmost (and the greatest) island: the anchorage is in 6 or 5 fathoms, quite exposed to southerly winds. Basseterre Point, which forms the west point of Connaigre Bay, is of moderate height, clear of wood, and from thence to Pass Island, bold to: Pass Island lies nearly W. by N., distant 3 miles from Bassaterre Point.

PASS ISLAND, which is the north-western extremity of Fortune Bay, is a full mile in length, and narrow; it bears from the N. Point of Miquelon N. E. by N. 7 leagues, and from Point May N ½ E. 12 leagues. It lies near the shore, and is rather lofty; on its S. Western side there are several rocks above water, which extend a full mile from the island; and to the N. W. is a sunken rock about a quarter of a mile from the island; there is a passage between this island and the main, about the length of two cables wide, it frequently is traversed by small vessels, who sometimes anchor there on fine sandy bottom, in 6 fathoms water. The cod-fishery about this part is generally considered good and productive.

REMARKS ON FORTUNE BAY.—The general appearance of the land on the northern side of Fortune Bay is hilly, rising directly from the sea, with craggy, barren hills, extending 4 or 5 leagues inland, having many rivulets and ponds; while that on the southern side of Fortune Bay has a very different appearance; having less of these rugged hills, and being better clothed with wood of a short brushy kind, giving to the country an air of greenness and fertility.

SOUNDINGS.—In the night time, or in dark foggy weather, the mariner should not place much dependance on the soundings in Fortune Bay, for therein they might be greatly and fatally deceived, inasmuch as, in many places, the water near the shores and in its creeks and harbors is often deeper than in the middle of the bay itself.

HERMITAGE BAY.—This extensive bay is bounded on the S. W. by Pass Island, and to the northward by the islands that form the Bay of Bonne and Great Jarvis Harbor, the width being more than two leagues: and by the southern shores of Long Island, where it begins to narrow; in sailing along the southern coast from Pass Island, you will discover the Fox Islands, which are distant from Pass Island 10 or 11 miles; these islands are situated opposite to the entrance to Hermitage Cove, about ¾ of a mile from the land, and are said to have good fishing about them; off the Northern Fox Island are several rocks above water, and a sunken rock lies also off the south side of this island. To enter Hermitage Cove you should keep between the islands and the shore, borrowing somewhat towards the main land, where you will find 30, 32, and 37 fathoms water; here you will see the cove open, and may turn in south, having deep water and without the least danger; the anchorage is good, with every conveniency for fishing, and plenty of both wood and water. From hence Hermitage Bay runs in nearly west for 12 miles, with very deep water, until you get near the head, where it gradually lessens to 25 and 22 fathoms, and further in to 9 fathoms; there is a small islet or two on the southern side, but no danger whatever.

LONG ISLAND, which separates the Bay of Despair from Hermitage Bay, is of a square form, about 8 miles long and nearly 8 leagues in circuit. The eastern passage is very good, but narrow, and is between the east end of Long Island and the main, called the Passage of Long Island. The west entrance into the Bay of Despair from Hermitage Bay is by the west end of Long Island. About half a mile from its S. W. point are two rocks above water, with deep water all round them.

GALTAUS HARBOR.—There are four harbors on the south side of Long Island, the easternmost of which is called Galtaus; this is but small, and lies near the south-east point of the island: the best channel into the harbor is on the west side of several rocky islands, which lie at the entrance, wherein are 4 fathoms; but in the harbor there are from 15 to 24 fathoms.

PICARRE HARBOR.—The next is Picarre, which lies N. by E. half a league from the easternmost Fox Island; in going in here, keep near the west point, in order to avoid some sunken rocks off the other: the anchorage is in the first cove on the east side, in 9 or 10 fathoms, sheltered from all winds.

ROUND HARBOR.—The next harbor, called Round Harbor, is about 2 miles to the westward of Picarre, and fit only for small vessels, the channel in being so narrow.

LONG ISLAND HARBOR is the fourth, and lies about 2½ miles from the west end of Long Island. This harbor has two arms, one running in to the north, the other to the eastward; they are both very narrow, and have from 40 to 7 fathoms water; the eastern arm is the deepest, and affords the best anchorage. The passage in is on either side of an island which lies off the entrance, and has several rocks above water about it.

BAY OF DESPAIR.—The entrance of the Bay of Despair lies between the west end of Long Island and Great Jarvis Island, (which lies in the mouth of the harbor of that name); the distance between is one mile and a quarter, and midway no bottom is found with a line of 280 fathoms. The Bay of Despair forms two capacious arms, one extending full 8 leagues to the north-eastward, the other about 13 miles northward: in the N. E. arm are several arms and islands, and tolerably good anchorage in several places; in the north arm there is very deep water, and no anchorage excepting in the small bays and coves which lie on each side of it; but in an arm of this bay, which runs easterly, there is a fine salmon fishery, and wood in plenty. In the N. E. arm also there are good salmon fisheries at Little River and Conne River; all the country about this part is mountainous and barren, but about the head of the bay it becomes level, and has abundance of wood, such as fir, pine, birch, witch hazel, spruce, &c.

GREAT JARVIS HARBOR is situated at the west entrance into the Bay of Despair; it is a safe harbor, with good anchorage in every part of it, in from 16 to 20 fathoms, secure from all winds, and plenty of wood and water. The passage in is on either side of the Great Jarvis Island; but the southernmost channel is the safest, there being no danger in it but the shore itself. In the northern channel are several sunken rocks. To sail in you should bring the north point between the two rocks above water, on the starboard side, and then steer directly in; this will carry you clear of some sunken rocks which lie on the west point of the island; these rocks appear at low water: the entrance to this harbor may be known by the east end of Great Jarvis Island, which is a high, steep, craggy point, called Great Jarvis Head, and is the northern point of the south entrance to the harbor.

BONNE BAY lies about a league to the westward of Great Jarvis Head, and nearly N. by E., distant 7 miles from Pass Island; it has several islands at its entrance, the westernmost of which is the largest and highest. The best passage in is to the eastward of the largest island, between it and the two easternmost islands. The bay runs in north 4 miles, and there is no danger but what shows itself; you may go on either side of Drake Island, which is small, and nearly in the middle of the bay; between which, and two small islands on the west side of the bay, within Great Island, there is anchorage in 20 or 30 fathoms; but the best place for large ships is near the head of the bay, in 12 or 14 fathoms, clear ground, and convenient for wood and water. On the N. W. side of Great Island, within the two small islands, is very good anchorage, in from 16 to 24 fathoms, secure from all winds. The entrance from this bay is to the northward of the two small islands. In sailing in or out of the bay, approach not too near the south point of Great Island, as there are some sunken rocks lying at one quarter of a mile from the shore. A little to the westward of Bonne Bay is Muskita Cove, a small inlet of from 30 to 47 fathoms water.

W. N. W., 4 miles from Bonne Bay, is the entrance to the Bays of Facheux and Dragon; this entrance being very conspicuous at sea, the coast may here be readily known.

FACHEUX, which is the easternmost branch, is very easily seen to seaward, it runs in N. N. E. 2 leagues, and is one-third of a mile wide at the entrance, with deep water in most parts of it. On the west side of the bay are three coves, where ships may anchor in from 10 to 20 fathoms. Dragon Bay lies in N. W. one league, and is near half a mile wide, with 60 or 70 fathoms water, and no anchorage excepting near the head; and then you must lie very near the shore. One mile to the westward of Facheux is Little Hole, with shelter for small craft; and one league to the westward of Facheux is Richard's Harbor, a place fit only for small vessels and fishing shallops, with 23 fathoms water in it.

HARE BAY.—N. W. by W. one league from Richard's Harbor is Hare Bay, which runs in N. N. E. about 5 miles, and is about one-third of a mile wide, with deep water, close home to both shores on all parts of it, except about one league up on the west side, where there is good anchorage, in from 8 to 15 fathoms, with plenty of wood and water, and a small cove about one mile up on the east side, where there are 30 fathoms, with gradual soundings to the shore.

DEVIL'S BAY.—N. W. about 4½ miles from Hare Bay, and one league N. E. from Hare's Ears Point, is Devil's Bay, a narrow inlet, extending a league to the northward, with deep water, and no anchorage until you come close to the head.

The Bay of Rencontre lies to the northward of Hare's Ears Point, and runs in N. W. by W. 2 leagues; it has deep water in most parts of it, and is near half a mile wide at the narrowest part. The anchorage is in 30 fathoms, above a low woody point on the south shore, quite land-locked. Hare's Ears Point is large, with a ragged rock upon it, which, from some points of view, looks like the ears of a hare. It lies W. by N. ⅓ N., distant 10 miles from Richard's Harbor, divides the Bays of Rencontre and Chaleur, and bears N. W. ½ W. 6 leagues from Pass Island. Off this point is a fishing bank, extending a full mile from the shore, having from 20 to 36 fathoms over it.

CHALEUR BAY.—Two miles to the westward of Hare's Ears Point is the Bay of Chaleur, which runs in about 2 leagues N. N. W. It is very narrow, and has deep water in most parts. At the north entrance into the bay, and close to the land, is a small island of moderate height, and half a league within the island, on the N. E. side of the bay, is a rock above water; a little within this rock, on the same side, is a small cove, with a sandy beach, off which you can anchor in 28 fathoms, a cable's length from the shore.

FRANCOIS BAY.—West, near half a league from the Bay of Chaleur, is the Bay of François, a small inlet running in N. W. ¼ W. one mile, being at the entrance, about a quarter of a mile broad, and 17 fathoms deep, but just within are 50 and 60 fathoms; at the head are from 30 to 20 fathoms, good anchorage, and very convenient for carrying on the fishing business.

OAR BAY.—Westward, 4 miles from the Bay François, on the east side of Cape la Hune, lies Oar Bay; off the east point of its entrance is a low rocky islet, and in the entrance of the bay is another, with a passage on each side of it. The bay runs in N. N. E. about 4 miles, and is one-third of a mile wide, with deep water close to both shores all the way up; at the head is a harbor for small vessels, with only 5 fathoms water. At the west side of the entrance into the bay is Cul de Sac, a little cove, with 3 and 4 fathoms water, and good shelter for small vessels.

CAPE LA HUNE is the southernmost point of land on this part of the coast, and lies in lat. 47° 31′ N. bearing W. N. W. ½ N. 8 leagues from Pass Island, and N. N. W. ½ N. 10 leagues from Cape Miquelon; its figure much resembles a sugar-loaf: this cape may also be known by the high land of La Hune, which lies one league to the westward of it, appearing flat at the top, and may be seen from a distance of 16 leagues.

THE PENGUIN ISLANDS lie W. S. W. ½ S. 10½ miles from Cape La Hune, and N. W. ½ N. 10 leagues from Cape Miquelon: they are an assemblage of barren rocks lying near to each other, and altogether about 2 leagues in circuit, and may be approached in the day time to the distance of half a league all round. On the W. S. W. side of the large island, which is the highest, is a small cove fit for shallops, and convenient for the fisheries, and the ground about it is considered to be good for fishing.

WHALE ROCK.—E. S. E. 8 miles from the Penguin Islands, and S. by W. 3 leagues from Cape La Hune, lies the Whale Rock, on which the sea generally breaks; it is about 100 fathoms in circuit, with 10, 12, and 14 fathoms close to all round it. From this rock a narrow bank extends one league to the westward, and half a league to the eastward, with from 24 to 58 fathoms water on it, rocky and gravelly bottom. In the channel between the shore and this rock, and also between the shore and the Penguin Islsnds, are 120 and 130 fathoms of water, muddy bottom, and there is the same depth of water at one league without them.

LA HUNE BAY lies close to the westward of Cape La Hune; it is about two leagues deep, and one-third of a mile wide, with deep water in most parts of it; but there is a sunken rock which lies off the west point of the entrance, nearly one-third of the channel over. In sailing in or out of this bay, you should keep the eastern shore on board, in order to avoid a sunken rock which lies off the west point of the entrance into the bay, nearly one-third over. Two miles up the bay is Lance Cove, having anchorage in 14 and 16 fathoms water, good clean ground. A cable's length off the southern point of this cove is a small shoal with 9 feet water, and between it and the point there are 5 fathoms. To sail into this place, keep the east point of the bay open of a red cliff point, off which is a rock above water, until the round hill you will see over the valley of the cove is brought on with the north side of the valley; you will then be above the shoal, and may haul into the cove with safety. There is a narrow bank which stretches quite across the bay, from the S. point of the cove to the opposite shore, whereon are from 27 to 45 fathoms.

LA HUNE HARBOR lies half a league to the westward of Cape La Hune; it has an island before its entrance, and is fit only for small vessels, and open to westerly winds: before it lies an island near the shore. The channel into the harbor is on the N. W. side of the island. There is no danger in going in, and you must anchor close up to the head, in 10 fathoms water. This harbor is well adapted for the fishery, there being good fishing ground about it, and a large beach quite across from the head of the harbor to La Hune Bay; a space of 800 feet, exposed to the open air, and well calculated for drying fish.

Four leagues N. W. $\frac{3}{4}$ W. from Cape La Hune is the entrance of Little River, which is about 100 fathoms wide at the entrance, and 10 fathoms deep; a little way up there is anchorage in 10, 8, and 7 fathoms water, good ground. Between Cape La Hune and Little River, the land is tolerably high, and forms a bay, where there are several small islands and rocks above water, the outermost of which lie N. N. E. $\frac{1}{2}$ E. 3 leagues from the Penguin Islands, and are called the Magnetic Rocks.

S. by W. $\frac{1}{2}$ W. 7 miles from the entrance of Little River, and N. by W. $\frac{1}{2}$ W. from the Penguin Islands, lie the Little River Rocks, which are just above water, with very deep water all round them.

THE ISLES OF RAMEA, which are of various extent, both in height and circuit, lie N. W. $\frac{1}{2}$ N. $5\frac{1}{2}$ leagues from the Penguin Islands, and one league from the main: they extend east and west 5 miles, and north and south 3 miles, and have several rocks and breakers about them; but more on the south side than on the north. The easternmost island is the largest, and is very high and hilly: the westernmost, called Columbe, is a remarkably high round island, of small circuit, with some rocky islands and sunken rocks near it.

RAMEA HARBOR.—There is a harbor for small vessels, formed by the islands which lie near Great Ramea and the Columbe, called Ramea Harbor, where they may lie sheltered from all winds. To enter this from the westward, you should give the southern point a berth, on account of some rocks that lie off the starboard island; these are all above water: steer E. N. E. towards the harbor, keeping as nearly mid-channel as you can, the passage is above a cable's length broad, and run for the anchorage in Ship Cove; this is the second inlet on the north-western shore; you will here ride safely, on clean ground, in 5 fathoms water. To enter from the eastward, you must keep the northern side of Great Ramea on board, until you are up to the west end thereof, then steer S.W. into the harbor, keeping in the middle of the channel, in about three fathoms, and anchor as before directed. This harbor is very convenient for fishing vessels; in it, and also about the islands, are several places fit for erecting stages and drying fish, which seem to be well calculated for that purpose.

The Ramea Rocks are two in number, close to each other; they lie about south, distant 4 miles, from the east end of Great Ramea. W. S. W. one league from these rocks is a small bank with only 6 fathoms water on it; and nearly in the middle, between Ramea and the Penguin Islands, is the New Bank, with from 14 to 50 fathoms water; to run upon the shoalest part of this bank, bring the two Ramea Rocks on with the south-western part of Ramea Islands, and between them and Columbe, and the entrance to Little River N.E. $\frac{3}{4}$ E.

OLD MAN'S BAY.—Four miles to the westward of Little River is Old Man's Bay, which runs in N. N. E. about 7 miles, and is nearly a mile wide; the water throughout the bay is very deep. About one mile and a half up the bay, on the eastern side, is a small island, called Adam's Island, behind which vessels can ride, if necessary, in 30 and 40 fathoms water; but the best anchorage is at the head, in 14 or 16 fathoms.

MOSQUITO HARBOR lies about half a league to the westward of Old Man's Bay; it is a snug and safe harbor, and will hold a great number of vessels in perfect security; but the entrance is so narrow, being only 48 fathoms in breadth, that it is difficult to get in or out; the land on both sides is high, and off the southern point of entrance is a large white rock, about a cable's length from which is a black rock, above water, on the southern side of which is a sunk rock, whereon the sea breaks; from this black rock to the entrance of the harbor, the course is about N. N. W., distant one-third of a mile. In sailing either in or out, you should give the black rock a small berth, keeping the western shore on board, and if obliged to anchor, be as quick as possible in getting a rope on shore, lest you drift on the rocks. In this harbor you will have from 18 to 30 fathoms water, with good riding every where, and plenty of both wood and water; in the narrows you will find 12 fathoms, the shores being bold to; south and easterly winds blow right in, northerly winds right out; and with westerly winds it is commonly either quite calm, or descends in irregular puffs.

Fox Island Harbor is formed by an island of the same name; it lies about half a league to the westward of Mosquito Harbor; between are several rocky islands and sunken rocks. This is a commodious harbor for small vessels, which may anchor in 8, 9, and 10 fathoms water. You may go in on either side of the island, and there is no danger but what shows itself.

WHITE BEAR BAY lies about 2 miles to the westward of Fox Island Harbor, and N. N. E. one league from Great Ramea Island; it has several islands at its entrance. It runs in N. E. $\frac{3}{4}$ N. about 4 leagues, is near half a mile wide in the narrowest part, and has deep water close to both shores, in most parts, to the distance of 8 miles up; then the ground rises at once to 9 fathoms, whence it shoalens gradually to the head, with good anchorage. The best passage into the bay is to the eastward of all the islands. On the S. W. side of Bear Island, which is the easternmost and largest in the mouth of the bay, is a small harbor, running in about east half a mile, with from 10 to 22 fathoms of water; but there are several sunken rocks before its mouth, rendering it difficult of access. At the western entrance is a high round white island, and S. W. half a mile from this island

is a black rock above water. The best passage into the bay, from the westward, will be to the westward of this black rock, and between White and Bear Islands; some of the rocks are above a mile off the land.

RED ISLAND HARBORS.—Five or six miles to the westward of White Bear Bay, and nearly north from Ramea Columbe, are two small harbors, called Red Island Harbors, formed by Red Island, which lies close under the land. The westernmost is the largest and best, and has from 6 to 8 fathoms water, good anchorage. In going in, keep the island close on board, the outer part of which is composed of steep red cliffs.

The BURGEO ISLES are a cluster of islands extending about 5 miles along shore, and forming several snug and commodious harbors. They lie about 3 leagues N. W. by N. from Ramea Columbe. To sail into Burgeo from the eastward, the best passage is on the N. E. side of Boar Island, which is the northernmost, and lies N. N. W. from Ramea Columbe. S. E. by S. from this island, half a league, is a rock, uncovered at low water, on which the sea generally breaks; you may go on any side of this rock, the water being deep all round it: so soon as you are to the N. W. of it, keep the north side of Boar Island on board, and steer W. ½ N. for Grandy's Cove, the north point of which is the first low point on your starboard bow; haul round that point, and anchor in the cove in 14 fathoms, and moor with a fast on shore. The best place for large ships to anchor in is betwixt Grandy's Cove and a small island, lying near the west point of Boar Island, in 20 or 24 fathoms, good ground, and sheltered from all winds. To sail into Grandy's Cove from the westward is dangerous, unless well acquainted: there are several safe passages in from the southward and eastward, between the islands, and good anchorage; and in bad weather all the sunken rocks discover themselves, and you may run in without any fear; but the islands do not afford either wood or water.

WOLF BAY extends inward N. E. by E. one league: the entrance is E. N. E. 2 miles from Boar Island, and 2 miles to the westward of Red Island Harbor; the east point of the entrance is composed of low rugged rocks, off which is a sunken rock, at the distance of a quarter of a mile from shore, over which the sea breaks in bad weather. Near the head of the bay is tolerably good anchorage, and plenty of wood and water.

King's Harbor lies round the west point of Wolf Bay, and runs in N. E. by E. three-quarters of a mile; before its mouth is a cluster of little islands. To sail in, keep the east point of these islands on board, and steer N. by W., and north for the entrance of the harbor, anchoring under the east shore in 9 fathoms.

HA-HA.—On the south side of the islands before King's Harbor, and nearly north one mile from Boar Island, is the entrance into the Ha-ha, which runs in W. N. W. one mile, and is about a quarter of a mile broad, with from 20 to 10 fathoms water, and good ground all over. Over the south point of the entrance into this harbor is a high green hill; and a cable's length and a half from the point is a sunken rock that always shows itself. Over the head of the Ha-ha is Richard's Head, a mark for running upon Ramea Shoal.

GREAT BARRYSWAY.—About 4 miles to the westward of the Burgeo Isles is the Great Barrysway Point, which is low, white, and rocky: and E. N. E. ½ E. half a league from this point is the west entrance into the Great Barrysway, wherein is room and depth of water for small vessels. Between the Burgeo Isles and the Great Barrysway Point are several sunken rocks, some of which are half a league from the shore.

CONNOIRE BAY.—N. W. ½ N., 4 leagues from the Burgeo Isles, is the east point of the Bay of Connoire: this point is so far remarkable that it rises with an easy ascent to a moderate height, and much higher than the land within it; the west point of the bay is low and flat, and to the westward of this are several small islands. The bay runs in N. E. by N. about a league from the east point to the middle head, which lies between the two arms, and is half a league wide, with 14, 12, 10, and 8 fathoms, close to both shores, good anchorage, and clear ground, but open to S. W. winds. The N. E. arm affords shelter for small vessels from all winds. To sail in keep nearest the starboard shore, and anchor before a small cove on that side, near the head of the arm, in 3½ fathoms; towards the head of the arm, on the north-western side, is a bank of mud and sand, upon which a vessel may run, if necessary, and receive no damage.

THE BAY OF CUTTEAU lies about 2 leagues to the westward of Connoire: its depth will admit small vessels only. Round the west point of Cutteau is Cinq Serf, wherein are a number of islands, which form several small snug harbors. Right off Cinq Serf, about half a league from the shore, is a low rocky island, westward of which is the safest passage into the largest harbor; keep near this rock, steering E. N. E. ¼ E. towards the south-eastern shore, until you get abreast of a small woody island; this is the easternmost except one, and lies about a quarter of a mile E. N. E. from a white rock in the middle of the channel; haul short round this island, and anchor behind it, in 7 fathoms water; here you will lie safely sheltered from all winds, or you may go further up, and anchor at its head in 4 fathoms.

GRAND BRUIT.—Four miles to the westward of the rocky island of Cinq Serf, is the harbor of Grand Bruit, which is small but commodious; and may be known by a very high, remarkable mountain over it, half a league inland, which is the highest land on all

the coast: down this mountain runs a considerable brook, emptying itself by a cascade into the harbor. Before the mouth of the harbor are several little islands, the largest of which is of middling height, with three green hillocks on it. A little outside of this island is a round rock, rather high above water, called the Columbe of Great Bruit; and a quarter of a mile to the southward of this rock, is a low rock: in a direct line between the low rock and the rocky isles of Cinq Serf, half a league from the former, is a sunken rock, whereon the sea does not break in fine weather. The safest passage into Grand Bruit is to the north-eastward of this rock, and of the islands lying before the harbor, between them and the three islands, which are low, and lie under the shore; and, after you are to the northward of the sunken rock above mentioned, there is no danger but what shows itself. The harbor extends N. N. E. half a mile, and is but a quarter of a mile wide in the broadest part; but it is bold to on both sides, and has a depth of from 4 to 7 fathoms.

BAY OF ROTTE.—To the westward of Grand Bruit, between it and La Poile Bay, lies the Bay of Rotte, wherein are a great many islands and sunken rocks. The southernmost is a remarkable high round rock, called the Columbe of Rotte, which lies N. W. by W. 8¾ leagues from the southernmost of the Burgeos. Between this island and Grand Bruit is a reef of rocks, some above and some under water, but they do not lie to the southward of the direct line between the islands. Within the Islands of Rotte there is shelter for shipping; the safest passage in is to the westward of the islands, between them and Little Ireland, which lies off the east point of La Poile Bay.

LA POILE BAY is large and spacious, and has several commodious harbors. It may be known by the high land of Grand Bruit, which is only 5 miles to the eastward of it, and likewise by the land on the east side of the bay, which rises in remarkably high craggy hills. About 1¼ mile S. W. from its east point lies Little Ireland, a small low island, environed with sunken rocks, some of which are one-third of a mile off: north, about half a mile from Little Ireland, is a sunken rock that shows itself at low water; this is the only danger in going into the bay, excepting such as lie very near the shore.

GREAT AND LITTLE HARBORS.—Two miles within the west point of the bay, and N. ½ W. 2 miles from Little Ireland, is Tweeds, or Great Harbor; its south point is low, and it extends inward W. N. W. one mile; it is about 1½ cable's length wide in the narrowest part: and the anchorage is near the head of the harbor, in 18 or 20 fathoms, clear ground, and sheltered from all winds. Half a mile to the northward of Great Harbor is Little Harbor, the north point of which, called Tooth's Head, is the first high bluff head on the west side of the bay; the harbor extends inward W. N. W. about a mile. In sailing in give the south point a small berth. You may anchor about half way up the harbor, in 10 fathoms water, before the stage which is on its northern side.

GALLY BOY'S HARBOR lies on the east side of the bay, opposite Tooth's Head; it is small, snug, and convenient for ships bound to the westward. The north point is high and steep, with a white spot in the cliff, and near its southern point are some hillocks close to the shore. To sail in or out, keep the north side on board. You must anchor so soon as you are within the inner south point, in 9 or 10 fathoms, good ground, and sheltered from all winds. One mile to the northward of Gally Boy's Harbor, between two sandy coves on the east side of the bay, and nearly two cables' length from the shore, is a sunken rock that just uncovers at low water.

Broad Cove is about two miles to the northward of Tooth's Head, on the same side of the bay. In this there is good anchorage, in 12 or 14 fathoms.

NORTH-EAST ARM.—About two leagues up the bay, on the eastern side, is the North-East Arm, which is a spacious, safe, and commodious harbor. In sailing in, give the low sandy point on the S. E. side a small berth, and anchor above it where convenient in 10 fathoms water, good holding ground, sheltered from all winds, and very convenient for wood and water.

Indian Harbor and De Plate lie just within the outer west point of La Poile Bay; these are two small coves, conveniently situated for the fishery, but fit only for small vessels, who may get in at high water.

Little Ireland bears from the southernmost of the Burgeos N. W. by W. ¼ W. 9¾ leagues, and lies nearly 11 leagues to the eastward of Cape Ray.

GARIA BAY.—From Little Ireland to Harbor la Coue, and La Moine Bay, the course is W. N. W. ¾ W. 9 or 10 miles; between lies the Bay of Garia and several coves, fit only for small vessels; before these there are several islands and sunken rocks scattered along the shore, but none of them lie without the above course. In bad weather all the sunken rocks discover themselves. To sail into Garia Bay, you will, in coasting along shore, discover a white head; this is the south point of an island lying under the land, off the eastern point of the bay, and a little to the westward of two green hillocks on the main; bring this white point N. N. E., and steer directly towards it; keep between it and the several islands that lie to the W. S. Westward; from the white point, the course into the bay is N. by W.; borrow towards the eastern point, which is low. The Bay of Garia affords plenty of timber, large enough for building of ships.

LA MOINE AND LA COUE HARBORS.—The S. W. point of the entrance into Harbor la Coue, called Rose Blanche Point, (near to which are some rocks above water,) is tolerably high, and the land near the shore over Harbor la Coue and La Moine Bay is much higher than any other land in the vicinity: by this they may be known. La Moine Bay extends inwards N. E. ¾ E. about 4 miles, and is one quarter of a mile broad in the narrowest part. Off the east point are some small islands, and rocks above water. In sailing in, keep the west point on board, until you have entered the bay; then edge over towards the east shore, and run up to the head of the bay, where you may anchor in 10 or 11 fathoms, good ground: here is plenty of wood and water. To sail into Harbor la Coue, which lies at the west entrance into La Moine Bay, steer in N. N. W. between a rock above water, in the mouth of the harbor, and the west shore; so soon as you are within the rock, haul to the westward, into the harbor, and anchor in 6 or 8 fathoms water, mooring with a hawser on shore; or you may steer into the arm, which runs in N. E. by. E. from the harbor, and anchor in 20 fathoms, sheltered from all winds. This has been the resort of the small fishing vessels for many years.

ROSE BLANCHE.—To the westward of Rose Blanche Point, is the harbor of the same name; it is small and snug, and the anchorage is in 9 fathoms water. The channel into the harbor is between the island lying off its western point, and Rose Blanche Point; give the island a good berth, on account of some sunken rocks which lie on its eastern side, and keep the west side of a small island which lies close to the point, on board, anchoring within the N. E. point of this island in 9 fathoms. To enter into the N. W. part of the harbor would be dangerous, if a stranger, because of its numerous islands and rocks.

Mull Race is a small cove 2 miles to the westward of Rose Blanche Point, wherein is anchorage for small vessels in 4 fathoms. Off the west point of the cove are two small islands, and several sunken rocks; the passage in is to the eastward of these.

Seven miles to the westward of Rose Blanche point are the Burnt Islands, which lie close under the shore, and are not easily to be distinguished from it; behind these is a shelter for small vessels. Off these islands are sunken rocks, some of which are half a mile from the shore.

CONNEY AND OTTER BAYS.—Six miles, to the westward of Rose Blanche Point, is Conney Bay and Otter Bay, both of which are rendered difficult of access by several sunken rocks outside of the passage; which do not show themselves in fine weather; but when once you are safe within Otter Bay, there is good riding in 7, 8, and 9 fathoms water.

DEAD ISLANDS HARBOR.—W. N. W. ¾ W., nearly 4 leagues from Rose Blanche Point, are the Dead Islands, which lie close under the shore; in the passage to Dead Islands Harbor, between the islands and the main, is good anchorage for shiping in 6 or 8 fathoms, sheltered from all winds; but it is very dangerous of access to strangers, as there are several sunken rocks in both the east and west entrance. The eastern entrance can be known by a remarkable white spot on one of the islands; bring this spot to bear N. by W. and steer in for it, keeping the starboard rocks on board, and leave the white spotted island on your larboard side. The western entrance may be recognized by a high point on the main, a little to the westward of the islands, on the western part of which point is a green hillock; keep this point close on board, until you get within a little round rock, near to the westernmost island, at the eastern point of entrance; then haul over to the eastward for the great island, distinguished by a high hill, and steer E. ¾ N., keeping the before mentioned little rock in sight.

PORT AUX BASQUE.—From the Dead Isles to Port au Basque, the course and distance are W.N.W. about 4 miles; between which lie several small islands close under the shore and there are sunken rocks, some of which are half a mile from the shore. Port aux Basque is a small commodious harbor, which lies about 2½ leagues to the eastward of Cape Ray. To fall in with it, bring the Sugar-Loaf Hill over Cape Ray, to bear N. N. W. ½ W. or the west end of the Table Mountain N. N. W. Steer in for the land with either of these marks, and you will fall directly in with the harbor: the S. W. point, called Point Blanche, is of a moderate height, and of white appearance; but the N. E. point is low and flat, and has, close to it, a black rock above water. In order to avoid the outer shoal, on which are three fathoms, and which lies E. S. E. three quarters of a mile from Point Blanche, keep the said point on board, and bring the flag-staff which is on the hill over the west side of the head of the harbor, on with the S. W. point of Road Island; that direction will lead you in the middle of the channel, between the east and west rocks, the former of which always show themselves, and these you leave on your starboard hand: continue this course up to Road Island, and keep the west point on board, in order to avoid the Frying-pan Rock, which stretches out from a cove on the west shore, opposite the island; and, so soon as you are above the island, haul to the E. N. E. and anchor between it and Harbor Island wherever you please, in 9 or 10 fathoms, good ground, and sheltered from all winds: this is called the Road or Outer Harbor, and is the only anchoring place for men of war, or ships drawing a great depth of water, but small vessels always lie up in the Inner Harbor. To sail into it, run in between the west shore

and the S. W. end of Harbor Island, and anchor behind the said island, in 3 or 4 fathoms. In some parts of this harbor ships can lay their broadsides so near to the shore as to reach it with a plank. This place has been frequented by fishermen for many years, it is well situated for their purposes, and is capable of most excellent accommodations; one mile to the eastwnrd of Basque is Little Bay.

GRAND BAY lies about two miles to the westward of Port aux Basque; there are several small islands and rocks in and before it, the outermost of which are not above a quarter of a mile from the shore, on these the sea generally breaks: it is only fit for small vessels.

From Port aux Basque to Point Enragée, the bearing and distance are W. N. W. about a league, and thence to Cape Ray N. N. W. nearly 1½ league. Point Enragée, is low; off it and to the eastward of it, are some sunken rocks a mile from the shore, on which the sea breaks.

CAPE RAY is the S. W. extremity of Newfoundland; the land of the cape is very remarkable; near the shore it is low, but three miles inland is a very high table mountain, which rises almost perpendicular from the low land, and appears to be quite flat at the top, excepting a small hillock on the S. W. point of it. This land may be seen, in clear weather, from the distance of 16 or 18 leagues. Close to the foot of the table mountain, between it and the point of the cape, is a high round hill, resembling a sugar-loaf, (called the Sugar-loaf of Cape Ray,) whose summit is a little lower than that of the table mountain; and to the northward of this hill, under the table mountain, are two other conical hills, resembling sugar-loves, which are not so high as the former; one or other of these sugar-loaf hills are, from all points of view, seen detached from the table mountain.

There is a sandy bay between Cape Ray and Point Enragée, wherein ships may anchor with the winds from N. N. W. to East, but they should be cautious not to be surprised there with S. W. winds, which blow directly in, and cause a great sea. The ground is not the best for holding, being fine sand. Towards the east side of this bay is a small ledge of rocks, one mile from shore, on which the sea does not break, in fine weather. The best place for large ships to anchor in is, to bring the point of the cape N. W. and the high white sand-hill in the bottom of the bay N. E. in 10 fathoms water. Small vessels may lie further in. Be careful not to run so far to the eastward as to bring the end of the table mountain on with the sand-hill, in the bottom of the bay, by which means the ledge of rocks before mentioned will be avoided.

N. W. ½ W. nearly one mile from the point of the cape, is a small ledge of rocks, called the Cape Rocks, whereon the sea always breaks; and, one mile to the northward of the cape, close under the land, is a low rocky island; there is a channel between the ledge and the cape, with 14 and 15 fathoms water, and also between it and the island with 4 and 5 fathoms; but the tides, which run here with great rapidity, render it unsafe for shipping.

The soundings under 100 fathoms do not extend above a league from the land to the southward and eastward of the cape, nor to the westward and northward of it, except on a bank which lies off Port aux Basque, between 2 and 3 leagues from the land, whereon are from 70 to 100 fathoms, good fishing ground. S. E. ½ S. about 13 leagues from Port aux Basque, in the lat. of 47 deg. 14 min. north, is said to be a bank, whereon are 70 fathoms.

THE TIDES.—Between Cape Chapeau Rouge and Cape Ray, in all the bays, &c. the tide generally flows till 9 o'clock, on full and change, and its perpendicular rise is about 7 or 8 feet on springs; but it must be observed, that the tides are every where greatly influenced by the winds and weather. On the coast, between Cape Chapeau Rouge and St. Pierre, the current sets generally to the S. W. On the south side of Fortune Bay, it sets to the eastward, and on the north side to the westward. Between Cape La Hune and Cape Ray, the flood sets to the westward in the offing, very irregularly; but generally 2 or 3 hours after it is high water by the shore. The tide or current is inconsiderable, excepting near Cape Ray, where it is strong, and at times sets quite contrary to what might be expected from the common course of the tides, and much stronger at one time than at another: these irregularities seem to depend chiefly on the winds.

THE WESTERN COAST OF NEWFOUNDLAND,

FROM CAPE RAY TO THE STRAIT OF BELLE ISLE.

FROM Cape Ray to Cape Anguille, the course and distance are N. ¼ E. 17 or 18 miles. Cape Anguille is the northernmost point of land you can see, after passing to the westward of Cape Ray; it is high table land, and covered with wood, in the country above it. Between the high land of the two capes the coast is low, and the shore forms a bay, wherein are the great and little rivers of Cod Roy; the northernmost is the great river, which has a bar-harbor, fit to admit vessels of 8 or 10 feet draught only at high water.

The shore may be approached between the two capes to half a league, there being no danger so far off. It is a good salmon fishery, and for building small vessels and boats, there being timber in abundance.

ISLAND COD ROY.—The Island of Cod Roy lies 1½ or 2 miles to the southward of Cape Anguille, close under the high land; it is a low, flat, green island, of nearly 2 miles in compass, in the shape of a horse-shoe, forming, between it and the main, a small snug bar-harbor for vessels of 10 or 12 feet draught; the safest entrance to it is from the southward.

COD ROY ROAD.—South-eastward from the island is Cod Roy Road, wherein is very good anchorage for shipping, in 8, 7, or 6 fathoms, on a clay bottom. With the south point of the island bearing about W. N. W., and the point of the beach on the inside of the island, at the south entrance into the harbor, on with a point on the main to the northward of the island, you will lie in 7 fathoms, and nearly half a mile from the shore; one league to the southward of Cod Roy Island is a high bluff point, called Stormy Point, off which a shoal stretches out a full mile; this point covers the road from the S. S. E. winds, and there is good anchorage all along the shore, between it and the island.

ST. GEORGE'S BAY.—From Cape Anguille to Cape St. George, the course and distance are N. N. E. ½ E. nearly 12 leagues; these two capes form the Great Bay of St. George, which extends inwards E. N. E. 18 leagues from the former, and E. S. E. 11 leagues from the latter; at the head of this bay, on the south side, round a low point of land, is a good harbor, with excellent anchorage in 8, 10, or 12 fathoms water: the river St. George empties itself into the head of this bay, but it is not navigable for any thing but boats. On the north side of the bay, before the isthmus of Port-a-Port, is good anchorage in 7 or 8 fathoms, with northerly winds; from off this place a fishing-bank stretches two-thirds across the bay, with from 7 to 19 fathoms water on it, dark sandy bottom.

CAPE ST. GEORGE may be readily known not only by its being the north point of the Bay of St. George, but also by the steep cliffs on the north part of it, which rise perpendicularly from the sea to a considerable height; and by Red Island, which lies 5 miles to the north-eastward of the cape, and half a mile from the shore: this island is about 1½ mile in length, and of middling height; the steep cliffs around it are of a reddish color: there is anchorage with off-shore winds under the N. E. end of the island, before a sandy cove on the main, which lies just to the northward of the steep cliffs, in 12 or 14 fathoms; you will there ride, covered from the S. W. winds by the island, and from the southerly and easterly winds by the main land, but there is no shelter whatever with winds from the N. or N. W., although this place was heretofore much resorted to by vessels in the fishing trade.

From abreast of Red Island, distant 4 or 5 miles, to Long Point, at the entrance into the bay of Port-a-Port, the bearing and distance are E. by N. 7 or 8 leagues: from Red Island to Guernsey Island, in the mouth of the Bay of Islands, E. N. E. ½ N. nearly 16 leagues: from Red Island to Cape St. Gregory, N. E. by E. full 20 leagues: and from Red Island to Point Rich, which is the north point of Ingornachoix Bay, N. E. ¼ E. 48½ leagues.

PORT-A-PORT.—The land between Red Island and the entrance into Port-a-Port is rather low, with sandy beaches, except one remarkable high hillock, called Round Head, close to the shore, about 2 leagues to the E. N. Eastward of Red Island; but up in the country, over Port-a-Port, are high lands: and, if you are 3 or 4 leagues off at sea, you cannot discern the long point of land which forms the bay; this bay is capacious, being above 5 miles broad at the entrance, and 4 leagues deep, running in to the South and S. Westward, with good anchorages in most parts of it. Long Point is the west point of the bay; it is low and rocky, and a ledge of rocks extends from it E. N. E. nearly a mile. S. E. by E. ¾ E. 4 miles from Long Point, and half a league from the east shore, lies Fox Island, which is small, but of middling height; from the north end of this island a shoal stretches out nearly 2 miles to N. N. Eastward, called Fox's Tail; and nearly in the middle of the bay, between Fox Island and the west shore, lies the Middle Ground, on one place of which, near the S. W. end, there are not above 3 or 4 feet water. From the head of the bay, projecting out into the middle of it, is a low point, called Middle Point, off which, extending 2 miles N. E. by N. is a shoal spit, part of which dries at low water: this Middle Point divides the bay into two parts, called East and West Bays. From the head of the East Bay, over to the Bay of St. George, the distance is a large quarter of a mile: this isthmus is very low, and has a pond in the middle of it, into which the sea frequently dashes over, especially at high tides, and with gales of wind from the southward. On the east side of it is a tolerably high mountain, rising directly from the isthmus, and flat at top; to the northward of this, and at about 5 miles distance from the isthmus, is a conspicuous valley, or hollow, hereafter to be used as a mark. N. E. by E. ½ E. above 2 leagues from Long Point, and half a league from the shore, lies Shag Island, which appears at a distance like a high rock, and is easily to be distinguished from the main: and W. N. W. about a league from it lies the middle of Long Ledge, which is a narrow ledge of rocks stretching E. N. E. and W. S. W. about 4 miles; the eastern part of them is above water, and the channel into the bay of Port-a-Port, between the west end of this ledge and the reef which stretches off from the west point of the bay, is a league wide.

In sailing into Port-a-Port, if coming from the S. Westward, advance no nearer to the Long Point of the bay than 1½ mile, until you have brought the valley, in the side of the mountain before mentioned, (on the east side of the isthmus,) over the east end of Fox Island, or to the eastward of it, which will then bear south a little easterly; you will then be clear of the Long Point Reef, and may haul into the bay with safety; but, if coming from the N. E. without the Long Ledge, or turning into the bay, in order to keep clear of the S. W. end of Long Ledge, bring the isthmus, or the foot of the mountain, (which is on the east side of the isthmus,) open to the westward of Fox Island, nearly twice the breadth of the island, and it will lead you into the bay clear of Long Ledge; and when Shag Island is brought on with the foot of the high land on the south side of Coal River, bearing then E. ¾ S., you will be within the Long Ledge: there is also a safe passage into the bay, between the Long Ledge and the main, on either side of Shag Island, and taking care to avoid a small shoal, of 2½ fathoms, which lies W. by N. one mile from the island.

To sail up in the West Bay and Head Harbor, keep the western shore on board; this shore is bold to. In turning between it and the middle ground, stand no nearer to the middle than into 8 fathoms; but you may stand to the spit of the Middle Point into 6 or 5 fathoms. The anchorage in West Bay is in about 8 fathoms, and in Head Harbor, in about 5 fathoms. The West Road lies before a high stone beach, about 2 miles south-westward of Long Point, where you may lie very secure from westerly and N. W. winds, in about 10 or 12 fathoms water: this beach is steep to, and forms an excellent place for landing and drying your fish; there is a good place at the northern end of Fox's Island for the same purpose. The whole bay and the adjacent coasts abound with cod, and extensive fishing banks lie all along the coasts.

The East Road lies between Fox Island and the east shore: to sail up to it, you should keep the high bluff head, which is about a league to the E. N. E. of the island, bearing to the southward of S. E. by E. ½ E, until the isthmus is brought to the eastward of Fox Island: you will then be within the shoal called the Fox's Tail, and may haul to the southward, and anchor any where between the island and the main, in from 10 to 18 fathoms.

To sail up the East Bay, pass between the island and the east shore, and after you are above the island, come no nearer to the main than half a mile, until you are abreast of a bluff point above the island, called Road Point, just above which is the best anchorage with N. E. winds, in about 12 fathoms water; and to sail up the East Bay between the Middle Ground and the Fox's Tail, bring the said bluff point on with the S. W. point of Fox Island; this mark will lead you up in the fairway between the two shoals; give the island a berth, and anchor as before directed, in from 8 to 12 fathoms water.

BAY OF ISLANDS.—From the Long Point at the entrance of Port-a-Port to the Bay of Islands, the bearing and distance are N. E. by E. 8 leagues. Be careful to avoid the Long Ledge; the land between is of considerable height, rising in craggy barren hills, directly from the shore. The Bay of Islands may be known by the many islands in the mouth of it, particularly the three named Guernsey Island, Tweed Island, and Pearl Island, which are nearly of equal height with the land on the main. If you are bound for Lark or York Harbors, which lie on the S. W. side of the bay, and are coming from the southward, run in between Guernsey Island and the South Head, both of which are bold to; but with southerly and S. W. winds approach not too near the South Head, lest calms and sudden gusts of winds should proceed from the high land, under which you cannot anchor with safety. There are several channels formed by the different islands, through which you may sail in or out of the bay, there being no danger but what shows itself, excepting a small ledge of rocks, which lie half a mile north-eastward from the northern Shag Rock, and in a line with the two Shag Rocks in one. If you bring the south Shag Rock open on either side of the North Rock, you will go clear to the eastward or westward of the ledge. The safest passage into this bay from the northward, is between the two Shag Rocks, and then between Tweed Island and Pearl Island.

LARK HARBOR.—From Guernsey Island to Tortoise Head, which is the north point of York Harbor, and the S. E. point of Lark Harbor, the course and distance are nearly S. S. W. 6 miles; Lark Harbor extends inwards W. S. W. nearly two miles, and is one third of a mile broad in the entrance, which is the narrowest part: in sailing into it with a large ship, keep the larboard shore on board, and anchor with a low point on the starboard side, bearing W. N. W., N. N. W., or N. N. E., and you will ride in 6 or 7 fathoms water, secure from all winds.

YORK HARBOR.—From Tortoise Head into York Harbor, the course and distance are W. S. W. nearly a league; there is good turning room between the Head and Governor's Island, which lies before the harbor: but you must be careful to avoid a shoal which runs off from a low beach point on the west end of Governor's Island, called Sword Point; there is also a shoal which spits off from the next point of Governor's Island, which must also be avoided: Tortoise Head just touching Sword Point will lead clear of it; in sailing in, give Sword Point a berth, passing which, the best anchoring ground is in 10 fathoms, along a sandy beach on the main, with Tortoise Head open of Sword Point: West and N. Westerly winds blow here with great violence.

Harbor Island lies at the entrance of the River Humber, and S. by E. ¾ E., 7 miles from Guernsey Island: at its S. W. point is Wood's Harbor, which is unfit for shipping. The River Humber, at about 5 leagues within the entrance, becomes narrow, and the stream is so rapid in some places, for about 4 leagues up, to a lake, that it is with great difficulty that even a boat can stem the current.

The North and South Arms are both long inlets, with very deep water up to their heads. On the east side of Eagle Island, between the North and South Arms, is anchorage in 8, 10, or 12 fathoms water. Under the north side of Harbor Island also is good anchorage with S. W. winds; and opposite to the S. E. end of Harbor Island, on the south side of the bay, is Frenchman's Cove, wherein is good anchorage in from 20 to 12 fathoms. The Bay of Islands was formerly much frequented by vessels in the cod fishery, and stages were erected at Small Bay, which lies a little on the outside of South Head; and the large beach on Swords Point, in Governor's Island, is an excellent place for drying the fish.

From the North Shag Rock to Cape St. Gregory, the course and distance are nearly N. E. 8 miles; and thence 13 or 14 miles, on a similar bearing, will carry you to the entrance of Bonne Bay. The land near the shore from the North Shag Rock to Cape St. Gregory is low, along which lie sunken rocks, a quarter of a mile from the shore: but a very little way inland it rises into a high mountain, terminating at the top in round hills.

CAPE ST. GREGORY is high, and between it and Bonne Bay the land rises directly from the sea shore to a considerable height; it is the most northerly land you can discern when you are sailing along shore between Red Island and the Bay of Islands.

BONNE BAY may be known, at the distance of 4 or 5 leagues, by the land about it; all that on the S. W. side of the bay being very high and hilly, and that on the N. E. side, and thence along the sea-coast to the northward, being low and flat; but, at about one league inland is a range of mountains, which runs parallel with the sea coast. Over the south side of the bay is a very high mountain, terminating at top in a remarkable round hill, very conspicuous when you are to the northward of the bay. This bay extends inward E. S. E. nearly 2 leagues, then branches into two arms, one of which runs in to the southward, and the other to the eastward; the southern arm affords the best anchorage; small vessels should ride just above a low woody point at the entrance into this arm, on the starboard side, before a sandy beach, in 8 or 10 fathoms water, about a cable's length from the shore; there is no other anchorage in less than 30 or 40 fathoms, excepting at the head of the arm, where there are from 25 to 20 fathoms water; in sailing into the East Arm, keep the starboard shore on board; and, a little round a point at the entrance, will be found a small cove, with good anchorage in 17 to 20 fathoms, but you must moor to the shore. There is a snug cove also close within the North Point, with anchorage in 6 or 7 fathoms water: in sailing in or out of Bonne Bay, with W. S. W. winds, come not near the weather shore, lest you should happen to be becalmed, or should meet with heavy gusts of wind; as the depth of water is too great to admit of your anchoring.

Ten miles to the northward of Bonne Bay is Martin Point, high and white, off which, about three-quarters of a mile, is a small ledge of rocks, whereon the sea breaks. Broome Point is low and white, and lies about a league to the northward of Martin Point; about half a mile W. S. W. from it lies a sunken rock that seldom shows itself; on the north side of Broome Point lies the Bay of St. Paul, wherein vessels may anchor with off-shore winds, but it is quite exposed to the sea.

COW HEAD lies about 4 miles to the northward of the Bay of St. Paul: this is a promontory, which has the appearance of an island, it being joined to the main only by a very low and narrow neck of land: about three-quarters of a mile off this head lies Steering Island, which is low and rocky, and is the only island on the coast between the Bay of Islands and Point Rich. Cow Cove lies on the south side of Cow Head, and ships may lie there in from 7 to 10 fathoms, sheltered from northerly and easterly winds. Shallow Bay lies on the north side of Cow Head, and has water sufficient for small vessels; at the N. E. side of the entrance is a cluster of rocky islands, extending E. N. E. and W. S. W., and at the W. S. W. side are two sunken rocks close to each other, which generally show themselves; they lie a cable's length from the shore, and there is a channel into the bay on either side of them. Steering Island lies right before this bay, which you may pass on either side, but come not too near its N. E. end, as there are some sunken rocks extending from it. This is considered the best situated for a fishery on all the coast, and the ground about its environs is eminently productive.

INGORNACHOIX BAY.—From Steering Island to Point Rich the course is nearly N. E. distant 50 miles; Point Rich is the northern point of Ingornachoix Bay. From Shallow Bay to the southern point of Ingornachoix Bay the coast is nearly in a straight line, there being all the way neither creek nor cove, where a vessel can find shelter from the sea winds, although there are a few places where they might anchor occasionally with land winds. About 6 leagues from Steering Island there is a hill, standing half a mile inland, which is commonly called Portland Bill, probably because it resembles Portland Bill in the English Channel, and alters not its appearance in whatever point of view it is taken.

PORT SAUNDERS and HAWKES HARBOR.—These are situated within, and to

the eastward of Ingornachoix Bay; at the entrance lies Keppel Island, which, at a distance, will not easily be distinguished from the main land; there is a passage on both sides of the island; to sail into Port Saunders there is no impediment or danger; you will leave Keppel Island on your starboard side, and when you get about half a mile within the entrance you can anchor in 12 or 14 fathoms water; but if you are intending to run up to the head of the harbor, you must keep the larboard shore on board, in order to avoid a ledge of rocks, which lies near the mid-channel; this is considered to be the best harbor for vessels that are bound to the southward.

HAWKES HARBOR.—To enter this harbor vessels commonly go to the southward of Keppel Island; the starboard shore is shoal, and has a sand-bank, which stretches along the land, and runs out two-thirds of the passage over, great part of which dries at low water; your course in will be E. S. E., keeping nearer to Keppel Island than to the main, until the eastern end of the island, which is a low stony beach, bears N. E. by N., or N. N. E., then steer S. S. E. ½ E. for a small island you will see, situated further up the harbor, keeping the larboard shore well on board; run direct for this island, and when you have brought the point at the south entrance of the harbor to bear N. N. E. ½ N., and are at the S. S. E. point of a bay on the starboard side of the harbor, you will then be beyond the shoal ground, and may anchor in 12 fathoms water; or else run within half a mile of the small island, and anchor there, which will be more convenient for both wood and water. This is the best harbor for ships bound to the northward. The land round about these harbors is generally low, and covered with wood: you may occasionally anchor outside, in the Bay of Ingornachoix, according as you find the prevailing winds.

POINT RICH is the south-western point of a peninsula, which is almost surrounded by the sea, being every where of moderate height, and projecting further to seaward than any other land on this side of Newfoundland, the coast from thence, each way, taking an inward direction.

PORT AU CHOIX.—Rounding Point Rich, on its northern side, you will meet with Port au Choix, small, but yet capable of admitting a ship of burthen, mooring head and stern; to sail in you should keep the starboard shore on board, and anchor just above a small island lying in the middle of the harbor. In this place, and also in Boat Cove, which lies a little to the north-eastward, there are several stages and places for drying fish.

OLD PORT AU CHOIX lies to the eastward of Boat Cove; it is a small but safe harbor, having at its entrance an island called Harbor Island, and on its western side some rocks, both above and under water: there is also another island lying E. N. E. ½ N., distant nearly a mile from Harbor Island, about which are several rocks, some of which stretch out towards Harbor Island, and render the passage very narrow between them: there are 4, 5, 6, and 7 fathoms water between Savage Island and the main, and 4 and 5 fathoms between Savage Island Rocks and Harbor Island; and nearly the same depth between Harbor Island and the western shore. To sail into Old Port au Choix, on the western side of Harbor Island, you must keep the island close on board; but to go in on the eastern side of the island, give the north-eastern point of the island a berth, and having well entered, you may anchor any where on the larboard side of the harbor, only avoiding the starboard side, for a shoal of sand and mud runs all along it.

BAY OF ST. JOHN.—This is an open and extensive bay, bounded by Point Rich to the southward, and Point Ferolle to the northward, having several islands within it, and some sunken rocks; the largest of these islands is St. John's, about 2½ miles in length, and 1¾ broad; this lies E. N. E. distant 8½ miles from Point Rich; on its south-western side is a small harbor, well calculated for the cod fishery, but too much exposed for shipping, as south-westerly winds commonly drive in a heavy sea. On the south-eastern or inner side of the island, and between it and One Head Island, vessels may lie much more secure, in 14 or 16 fathoms water, and sheltered from most winds; and this is considered to be the only safe anchorage in the whole bay. West from St. John's Island, one large mile, is Flat Island, having a rock above water at its southern end; the channel between St. John's and Flat Island has from 13 to 25 fathoms in it, and they are both bold to; the Twin Islands lie N. E. by N. from Flat Island, distant one league, and have no danger about them. To the westward of the Twins are several scattered rocks above water, named the Bay Islands; they have deep water around them, but no anchorage. The land at the bottom of the bay is very high, and there is the little river of Castors, the entrance to which is dangerous and shallow, therefore seldom frequented. From the northern point of this bay a rocky shoal extends all the way to Point Ferolle, stretching out 2½ miles from the shore.

POINT FEROLLE lies N. E. by E. from Point Ritch, distant 22 miles; it is of moderate height, and joined to the main by a neck of land, which divides the Bay of St. John's from New Ferolle Bay, making it appear like an island when seen from a distance; its northern shore is bold to, and this part of the coast will easily be known by the adjacent table land of St. John's, the west end of which mountain lies from the middle of Ferolle Point S. by W., and its eastern end S. E. ¾ S.

NEW FEROLLE BAY is a small cove lying to the eastward of the point, and is quite

flat all over, there being not more than 2 and 3 fathoms at any part; it is quite open to the northerly winds, has a stage on each side of it, with plenty of room for others.

St. Margaret's Bay is large, and has several islands within it; also various inlets or coves affording good anchorage, particularly on its western side, which is the best situation for ships, being most clear of danger, and convenient for wooding and watering; on its banks are spruce and fir trees in plenty, and many rivulets of fresh water. Dog Island is to the eastward of Point Ferolle full 3 miles, and only divided from the main at high water; it is higher than any land near it, which gives it the appearance, when seen from the eastward, of an island situated at some distance from the main.

OLD FEROLLE.—To the eastward of Dog Island about 5 miles is Ferolle Island. This island lies parallel to the shore, and forms the harbor of Old Ferolle, which is very good and safe: the best entrance to it is at the S. W. end of the island, passing to the southward of a small island in the entrance, which is bold to; as soon as you are within it, haul up E. N. E., and anchor under the S. W. end of Ferolle Island, in 8 or 9 fathoms, good ground, quite land-locked. There is also good anchorage any where along the inside of the island, and a good channel up to the N. E. end thereof. There are some little islands lying at the N. E. end of Ferolle Island, and on the outside are some ledges of rocks a small distance off.

BAY OF ST. GENEVEIVE.—From the north end of Ferolle Island to St. Geneveive Head, the course is E. N. E. 4½ miles, and thence to the west end of Currant Island it is north-eastward about 3 miles. There are several small islands lying in and before this bay, only two of which are of any considerable extent. The afore-mentioned Currant Island is the northernmost of the two, and the largest; it is of a moderate height, and when you are to the E. N. E. of it, the western point will appear bluff, but not high; and when you are to the westward of it, it appears flat and white. The other, called Gooseberry Island, lies nearly a mile to the southward of it, and its west point bears from the west point of Currant Island S. S. W. ½ W. nearly a mile. Gooseberry Island has a cross on its S. W. end, from which point stretches out a ledge of rocks near half a mile to the southward; there is also a shoal about half a mile to the W. S. W. from the S. W. point of Currant Island. The best channel into this bay is to the southward of these islands, between the rocks which stretch off them and a small island lying S. S. W. from them, which island lies near the south shore: in this channel, which is very narrow, there are not less than 5 fathoms at low water, and the course in is E. by S. southerly, until you come to the length of the afore-mentioned island, passing which, you should haul to the southward, and bring St. Geneveive Head between the small island and the main, in order to avoid the middle bank. You may either anchor behind the small island in 5 or 6 fathoms water, or proceed farther, with the said mark on, until the S. W. arm is open, and anchor in the middle of the bay, in 7 or 8 fathoms water. Here is wood and water to be had. There is tolerably good anchoring in most parts of the bay, but the snugest place is the S. W. arm; the entrance to it is narrow, and has only 4 fathoms at low water. In coming into the bay, if you get out of the channel on either side, you will shoalen your water immediately to 3 or 2 fathoms.

BAY OF ST. BARBE.—From the west end of Currant Island to St. Barbe Point it is E. by N. 2½ miles, and from St. Barbe Point to Anchor Point it is N. N. E. nearly 1½ mile. Between them lies the Bay of St. Barbe; it runs in S. by E. about 2 miles from Anchor Point. To sail in, give Anchor Point and all the east side of the bay a good berth, to avoid the sunken rocks which lie along that shore: you must be well in before you can discover the entrance into the harbor, which is but narrow; then steer south, keeping in the middle of the channel, and anchor as soon as you are within the two points in a small cove, on the west side, in 5 fathoms water, on sand and mud, quite land-locked. Near this place branch out two arms or rivers, one called the south, and the other the east; the latter has 3 fathoms a good way up, but the former is shoal. Between the S. W. point of the bay and west point of the harbor is a cove, wherein are sunken rocks, which lie a little without the line of the two points; in the open bay are 7, 8, or 9 fathoms; but the N. W. winds cause a heavy sea to fall in here, which renders it unsafe.

From Anchor Point to the extremity of the Seal Islands, the course is N. E. ½ E. one league; off Anchor Point a ledge stretches itself W. by S. about one-third of a mile; there are no other dangers between it and the Seal Islands but what lie very near the shore.

The Seal Islands are white and rocky, and must not be approached but with care on their north and western sides, because there are some sunken rocks near them.

From the N. W. Seal Island to the N. W. extremity of Flower Ledge, it is N. N. E. near 2 miles; part of this ledge appears at low water, and there are 10 fathoms close on its off side.

MISTAKEN COVE.—From the north part of Flower Ledge to Grenville Ledge, it is about 1½ mile E. by S., and Grenville Ledge lies about two-thirds of a mile W. by N. from the eastern point of Mistaken Cove, between which and Seal Islands lie also Nameless Cove and Flower Cove, neither of which are fit for ships.

SAVAGE COVE.—Close to the eastward of Mistaken Cove is Savage Cove, which has a little island in its entrance, and is only fit for small vessels and boats.

Sandy Bay lies 2 miles eastward from Savage Cove, where small vessels may ride in 3 or 4 fathoms water, with the winds from E. to S. W.

About E. N. E., 5 large miles from Sandy Bay, is Green Island; between them, at 3 miles distant, W. ½ S. from Green Island, is the north extremity of Double Ledge, which extends nearly two-thirds of a mile from the shore, and has only 8 or 9 feet water on it.

Green Island lies about three-fourths of a mile from the main, is two-thirds of a mile in length, very low and narrow, and agreeable in color to the name it bears; from the east end of it a ledge of rocks extends three-fourths of a mile to the eastward, on which the sea breaks in bad weather. There are 4 or 5 fathoms water in the channel between the island and the main, where ships may anchor if necessary. To go in from the westward keep the island close on board for the deepest water, which is 4 fathoms; and going in from the eastward keep the main on board. From this island to the opposite part of the coast of Labrador, called Castles, or Red Cliffs, which is the narrowest part of the Strait of Belle Isle, the distance is about 3¾ leagues, and they bear from each other N. N. W. and S. S. E.

BOAT HARBOR.—From Green Island to Boat's Head it is E. ½ N. 8 leagues; between there is no shelter on the coast, but to the south-eastward of Boat's Head is a cove, called Boat Harbor, where small vessels and boats may lie very secure, except with N. E. winds.

Cape Norman lies E. 4 miles from Boat's Head, and is the northernmost point of land in Newfoundland; this has been already described. (See page 36.)

TIDES.—The tides flow at the full and change of the moon as follows: at New and Old Ferolle, till a quarter after 11 o'clock; in the Bays of Geneveive and St. Barbe, at half after 10, and at Green Island until 9. Spring tides rise 7 feet, neaps 4 feet. In the Bay of Pistolet it flows till three-quarters after 6, and in Noddy Harbor and Griquet, until a quarter after 5: spring tides rise 5 feet, neaps about 3. Before Quirpon, in settled weather, the tide sets to the southward 9 hours out of the 12, and stronger than the northern stream. In the Strait of Belle Isle the flood, in the offing, sets to the westward two hours after it is high water on the shore; but in blowing weather this stream is subject to many alterations.

GULF OF ST. LAWRENCE.

The following directions for navigating this Gulf are taken, with some alterations as to arrangement, from those of Captain H. W. Bayfield, R. N., who has been employed in a minute survey of this gulf for some years.

The main entrance into this Gulf is between Cape May, the South-Western point of Newfoundland, and Cape North, the North-East point of Cape Breton Island.

ICE.—Among the difficulties of the navigation may be mentioned the ice. In spring the entrance and eastern parts of the gulf are frequently covered with it, and vessels are sometimes beset for many days. Being unfitted for contending with this danger, they often suffer from it, and are occasionally lost; but serious accidents from this cause do not frequently occur, because the ice is generally in a melting state, from the powerful effect of the sun in spring. In the fall of the year accidents from ice seldom occur, except when the winter commences suddenly, or when vessels linger imprudently late from the temptation of obtaining high freights.

FOGS.—But all danger from ice is far less than that which arises from the prevalence of fogs: they may occur at any time during the open or navigable season, but are most frequent in the early part of summer; they are rare, and never of long continuance during westerly winds, but seldom fail to accompany an easterly wind of any strength or duration. The above general observation is subject, however, to restriction, according to locality or season. Thus winds between the south and west, which are usually clear weather winds above Anticosti, are frequently accompanied with fog in the eastern parts of the gulf. Winds between the south and east are almost always accompanied with rain and fog in every part. E. N. E. winds above Point de Monts, are often E. S. E. or S. E. winds in the gulf, changed in direction by the high lands of the south coast, and have therefore in general the same foggy character. I speak of winds of considerable strength and duration, and which probably extend over great distances. Moderate and partial fine weather winds may occur without fog at any season, and in any locality. In the early part of the navigable season, especially in the months of April and May, clear weather, N. E. winds are of frequent occurrence, and they also sometimes occur at other seasons, in every part of the Gulf and River St. Lawrence.

The fogs sometimes last several days in succession, and to a vessel either running up or beating down, during their continuance, there is no safe guide but the constant use of the deep sea lead, with a chart containing correct soundings.

The fogs, which accompany easterly gales, extend high up into the atmosphere, and cannot be looked over from any part of the rigging of a ship. They, however, are not

so thick as those which occur in calms after a strong wind, and which are frequently so dense as to conceal a vessel within hail; whilst the former often, but not always, admit the land, or other objects, to be distinguished at the distance of half a mile or more in the day time.

The dense fogs which occur in calms, or even in very light winds, often extend only to small elevations above the sea; so that it sometimes happens, that when objects are hidden at the distance of 50 yards from the deck, they can be plainly seen by a person 50 or 60 feet up the rigging. In the months of October and November the fogs and rain that accompany easterly gales are replaced by thick snow, which causes equal embarrassment to the navigator.

WINDS.—The prevailing winds during the navigable season are either directly up or directly down the estuary, following the course of the chains of high lands on either side of the great valley of the St. Lawrence. Thus a S. E. wind in the gulf becomes E. S. E. between Anticosti and the south coast, E. N. E. above Point de Monts, and N. E. above Green Island. The westerly winds do not appear to be so much guided in direction by the high lands, excepting along the south coast, where we have observed a W. S. W. wind at the island of Bic become W., W. N. W., and N. W., as we ran down along the high and curved south coast, until it became a N. N. W. wind at Cape Gaspé. These winds frequently blow strong for three or four days in succession; the westerly winds being almost always accompanied with fine, dry, clear and sunny weather; the easterly winds as frequently the contrary, cold, wet, and foggy. In the spring the easterly winds most prevail, frequently blowing for several weeks in succession. As the summer advances, the westerly winds become more frequent, and the S. W. wind may be said to be the prevailing wind in summer in all parts of the river and gulf. Light south winds take place occasionally; but north winds are not common in summer, although they sometimes occur. Steady N. W. winds do not blow frequently before September, excepting for a few hours at a time, when they generally succeed easterly winds which have died away to a calm, forming the commencement of strong winds, and usually veering to the S. W. The N. W. wind is dry, with bright clear sky, flying clouds, and showers. After the autumnal equinox, winds to the northward of west become more common, and are then often strong steady winds of considerable duration. In the months of October and November the N. W. wind frequently blows with great violence in heavy squalls, with passing showers of hail and snow, and attended with sharp frost.

Thunder storms are not uncommon in July and August: they seldom last above an hour or two; but the wind proceeding from them is in general violent and sudden, particularly when near the mountainous part of the coast, sail should, therefore, be fully and quickly reduced on their approach.

Strong winds seldom veer quickly from one quarter of the compass to another directly or nearly contrary: in general they die away by degrees to a calm, and are succeeded by a wind in the opposite direction. I do not mean, however, by this observation, that they may not veer to the amount of several points. N. W. winds seldom or never veer round by N. and N. E. to east and S. E; but they do frequently, by degrees, to the S. W., after becoming moderate. S. W. winds seldom veer by the N. W. and north to the eastward, but sometimes by the south to S. E. and east. Easterly winds generally decrease to a calm, and are succeeded by a wind from the opposite direction.

In the fine weather westerly winds of summer, a fresh topgallant breeze, will often decrease to a light breeze or calm at night, and spring up again from the same quarter on the following morning: under these circumstances only may a land breeze off the north coast be looked for. I have observed the same off the south coast also, but not so decidedly or extending so far off shore. I have occasionally carried the north land wind nearly over to the south coast just before daylight, but have never observed the south land wind extend more than 5 or 6 miles off, and that very rarely. Under the same circumstances, that is with a fine weather westerly wind going down with the sun, a S. W. land breeze will frequently be found blowing off the north coast of Anticosti at night and during the early part of the morning. If, however, the weather be not settled fair, and the wind does not fall with the sun, it will usually prove worse than useless to run a vessel close in shore at night in the hope of a breeze off the land. Such is the usual course of the winds in common seasons, in which a very heavy gale of wind will probably not be experienced from May to October, although close-reefed topsail breezes are usually common enough. Occasionally, however, there are years, the character of which is decidedly stormy. Gales of winds, of considerable strength, then follow each other in quick succession and from opposite quarters.

BAROMETER.—The marine barometer, which is at all times of great use to the navigator, becomes particularly so in such seasons; and the following remarks upon its general indications, when taken in connexion with the usual course of the winds and weather in the St. Lawrence, may, therefore, be useful. The barometer has a range from 29 to 30·5 inches in the Gulf and River of St. Lawrence during the navigable season, and its changes accompany those of the winds and weather with a considerable degree

of constancy. The fluctuations of the barometric column are much greater and more frequent there than in lower latitudes; and sudden alterations, which in other climates would be alarming, may occur there without being followed by any corresponding change either in the wind or weather. But the navigator should not be inattentive to those minor changes, as a constant attention to the instrument can alone enable him to appreciate those decisive indications of the mercury which seldom or never prove deceptive. The following remarks will apply to those well-marked changes which usually indicate the approach of a gale of considerable strength, or of a shift of wind and weather; the correct anticipation of which is often of the utmost consequence to the safety of a vessel, as well as to the length of her voyage. When, after a continuance of westerly winds and fine weather, the barometer has risen nearly to its greatest height, say some tenths above 30 inches, or begins to fall a little, an easterly wind may be soon expected. If to this notice given by the barometer be added a warm hazy atmosphere during the day, and a heavy precipitation of dew at night, with very bright twinkling stars, or a colored aurora borealis, the approach of an east wind is almost certain. If land be in sight at such a time, and appears much distorted by terrestrial refraction, or if vessels in sight have the relative proportions of their hull and sails changed by the *mirage*, or present double or treble images, such appearances will render the before probable indications of the barometer certain. At the commencement the easterly wind will probably be light with fine clear weather, but this will not last above a few hours if the barometer continues to fall; on the contrary, the wind will gradually increase, and as it does so the sky will become overcast by degrees until it is completely clouded. Rain and fog will follow, and continue during the continuance of the easterly wind with little intermission, until they are dissipated by a fresh breeze from the contrary quarter.

If the fall of the barometer, during the continuance of the easterly wind, be very slow, the gale will probably continue, and not be very violent: if rapid, it will probably be of short duration, and of greater strength: at any rate, when the mercury falls towards 29 inches, a change is certainly at hand, and the gale will in general come from the N. W. The strength of this succeeding gale will be in proportion to the fall of the barometer, and to the strength of the easterly gale which preceded it. In such a case, there is seldom many hours interval between the one gale and the other. The east wind generally dies away to calm, and in a very few hours, or sometimes in much less time, the N. W. gale springs up. A heavy cross sea remains for some time from the previous gale. The barometer sometimes begins to rise in the interval of calm which precedes the N. W. gale, at others at its commencement: the fog and rain cease, and the weather becomes quite clear, generally in a few hours, and sometimes almost immediately. The strength of the westerly gale is usually greatest soon after its commencement, and diminishes as the barometer rises, veering gradually to the W. and S. W. It is worthy of remark, that the circumstances just mentioned are exactly the reverse of those attending the easterly gale. The latter usually commences with clear weather and a high barometer, light at first from the S. or S. E., and gradually increasing as it veers to the eastward, with a falling barometer. To return to the westerly gale.—If, after it has veered to S. W. and become moderate, the barometer remains steady at a moderate height, fine weather may be expected. If it remains at a considerable height, but still fluctuating and unsteady, within certain limits, variable, but not heavy winds, and variable weather may be expected. If, on the contrary, it rises quickly to a great height, a repetition of the easterly gale will not be improbable. We have experienced seasons in which the barometer may be said to have been no sooner blown up by one wind, than it has been blown down by another, and this stormy alternation to have continued for several months, whilst in others we have scarcely had a double-reefed topsail breeze during the whole summer.

There is in fact so great a difference in the phenomena of the weather in different seasons, that it becomes very difficult to write any thing respecting it, that shall not be liable to many exceptions. There are, however, some strongly marked cases of connexion, between the indications of the barometer and changes of the winds and weather, which, within our experience of eight or nine years, have been subject to few, I might almost say no, exceptions. The first of these cases is that most common one, which I have endeavored to describe, of an easterly gale, with a falling barometer, being always wet and foggy, and succeeded by a strong wind from the opposite quarter with a rising barometer. A second case, not of so frequent occurrence in common seasons, excepting in spring or early in summer, is the easterly wind with a rising barometer; which, although it may not be at first for a few hours, will almost always become fine and clear, and end in fine weather. A third case may be considered certain; if the barometer fall suddenly and greatly, at any time, a northerly, and most probably a N. W. gale, of great strength, may be confidently expected. It does not follow that it will be immediate, for it may be preceded by a strong gale from S. W., for a few hours, during which the barometer will seldom rise, and even, probably, continue to fall, but when the S. W. gale dies away, the northerly, or N. W. will soon succeed, with a rising barometer.

In conclusion, I may remark that as, on the one hand, a considerable fall of the ba-

rometer may occur, without being followed by a strong wind; so, on the other, a breeze of considerable strength may come on without any indication from the barometer: but not any thing that deserves the name of a gale. There has never, within our experience, occurred a gale, so heavy as to be of serious consequence to a good vessel, the approach of which has not been indicated by the barometer. But it must be remembered that a high barometer, in this climate, and under the circumstances which I have mentioned, is often indicative of an easterly gale. It is remarkable that, in the gulf and estuary of the St. Lawrence, a high barometer may be considered as the forerunner of wet and foggy weather, which usually accompanies its fall; whilst a low barometer renders it equally probable that dry weather will ensue, since it often accompanies its rise. I am fully of opinion, that the marine barometer is of the greatest assistance in the navigation of the Gulf and River St. Lawrence, and that by attending constantly to its state and changes, with reference to the winds and weather which preceded them, combined with the indications afforded by the appearance of the sky, &c., those changes of the wind and weather, which are about to take place, may be anticipated with a degree of certainty sufficient, in most cases, to enable us to avoid being caught on a lee-shore, or in an unsafe anchorage, as well as to regulate our course in a voyage, in anticipation of the coming change.

CURRENTS.—It is a generally received opinion that a current sets constantly to the south-eastward out of the Gulf of St. Lawrence, between Newfoundland and Cape Breton Islands, and also that it is frequently deflected to the southward, towards the shores of the island last named, by another current from the northward, which is said to enter the gulf by the Strait of Belle Isle.

I have myeslf observed that a current sets out, between Cape Ray and St. Paul Island, during westerly winds and in calm weather; but it is checked by easterly winds, and I believe that it may sometimes run in a contrary direction from the same cause. Northerly winds, and perhaps also the above named current from the northward, may cause the stream to set to the southward towards Cape Breton Island. But the truth is, that winds, both present and at a distance, possess so powerful and irregular an action upon the set and strength of the currents and tides in this entrance of the gulf, that I can say nothing certain or definite respecting them.

The reality of a current inwards through the Strait of Belle Isle, is confirmed by the presence of icebergs, which it transports into the gulf every summer, against the prevailing S. W. winds, frequently carrying them as far as Mecatina, and sometimes even to the neighborhood of the east point of Anticosti. It is probable that this is a branch of the great current from Davis Strait, which is known to run along the coast of Labrador, and to transport numerous icebergs far to the southward every year. Its strength is very much increased by a prevalence of N. E. winds: at such times it runs at the rate of 2 knots through the strait, and for 30 to 40 miles further to the westward, diminishing gradually in force as it spreads out in the wider parts of the gulf. Usually, however, its rate is much less. At times, when S. W. winds prevail, it becomes very weak; and it has even been reported to me, that a current has been observed setting out of the gulf, in a contrary direction, to the N. E., for days together, but this was never observed by us during either of the three seasons which we passed there. There is, however, no doubt that this current is extremely irregular, as might be expected at the narrow outlet of a great inland sea, where winds, both within and without, must of necessity possess great influence.

After entering the gulf, it runs along the north, or Labrador coast, at the distance of 2 or 3 miles from the outer islands, leaving a narrow space inshore, in which the streams of the tides, when uninfluenced by winds, are tolerably regular. Passing outside of Mistanoque, the islands of Grand Mecatina, and the South Maker's Ledge, it pursues a direction given to it by the trending of the coast, till it is turned gradually to the southward, by the weak current which is often found coming from the westward between Anticosti and the north coast, during westerly winds, and which is set off to the southward from Natashquan Point. The united streams continue their southern course at a rate diminishing as they become more widely spread, and which seldom exceeds half a knot: and, finally, joining the main downward current out of the St. Lawrence, of which an account will be given immediately, they all pursue a S. E. direction towards the main entrance of the gulf, between Cape Ray and the Island of St. Paul. It is this current, from the northward, which is felt by vessels crossing from off the Bird Rocks towards Anticosti; and which, together with neglecting to allow for the local attraction of the compass, has been the principal cause of masters of vessels so often finding themselves unexpectedly on the south coast. Many shipwrecks have arisen from this cause near Cape Rosier, Gaspé, Mal Bay, &c.

Both these currents, viz., that from the northward, and the main downward current of the St. Lawrence, are modified by the tides, but in a way directly contrary; for the northern current, in through the Strait of Belle Isle, is accelerated by the flood, and checked by the ebb; whilst the other is accelerated by the ebb, and checked by the flood tide. These modifying causes, viz., the tides and winds, give rise to various combinations,

and consequent irregularities, in the direction and strength of these streams, which it is extremely difficult at all times to estimate and allow for correctly.

TIDES IN THE STRAIT OF BELLE ISLE.—Near the shores on either side there is usually a regular alternation of flood and ebb in fine weather, but it is not constant.

The flood comes from the northward along the coast of Labrador, and also from the S. E., from Cape Bauld to Cape Norman. The latter stream, I have reason to believe, is often turned off to the northward by Cape Norman, and the same thing takes place at Green Island, on the Newfoundland side towards Greenly Island on the opposite side of the strait. There is moreover, at times, a stream running from the S. W. for several days together, along the west coast of Newfoundland. This stream occasionally sets from Point Ferolle obliquely across the strait towards Forteau Bay. Sometimes, and especially with N. E. winds, the current runs directly in an opposite direction along the west coast of Newfoundland from Point Ferolle past Point Rich. In short, there is no constancy either in the rate or set of these streams, for the winds and the irregular tides modify the set and rate of the equally irregular currents, in a manner which it is extremely difficult, if not impossible, to calculate upon with any degree of certainty. The prevalent current from the northward comes from between Belle Isle and the coast of Labrador. It is often at the temperature of the *freezing point*, bringing many icebergs into the strait, and frequently carrying them through it many miles up the gulf. Some of these bergs ground in deep water, whilst others are continually changing their positions. They are much more numerous in some seasons than in others, as I have seen 200 bergs and large pieces of ice in the strait in the month of August in one year, whilst there were not above half a dozen to be seen in the same month of the following season.

I have observed this current from the northward and eastward assisted by a N. E. wind, running full two miles an hour, whilst at other times it was almost insensible. It is even reported that there is sometimes a current in the opposite direction, and I believe that this report of the fishermen is correct, especially during the ebb tide, and when S. W. winds prevail in the Gulf. At the same time that this current is running to the westward, there is at times a stream of warmer water running out to the eastward on the Newfoundland side, especially during the ebb tide.

From these remarks it will plainly appear that the navigation of this strait is attended with very great danger in dark or foggy nights, during which no vessel should attempt to run through; for I have found that, with all our experience, we could not be sure of the vessel's position within 10 miles under such circumstances. On the approach of a dark or foggy night, therefore, it would be prudent to anchor in some one of the bays on the north side of the strait, rather than to continue under way. A vessel bound in to the Gulf, and running with an easterly wind, will however find no place fit for that purpose until she arrives at Black Bay, and that is not a very good anchorage, for Red Bay cannot be entered by a large vessel with an easterly wind. Loup Bay is the first good anchorage under such circumstances, and there the vessel would be so far advanced in her run through the strait that it would not be worth while to stop, since she might easily clear every thing in the remaining short distance. But with a S. W. wind, at the approach of night, and appearance of a fog, a vessel bound out through the strait to the eastward, had better stand off and on under easy sail, tacking by her deepsea lead from the Newfoundland side till morning, if she be not further to the eastward than Point Ferolle. If she be further advanced, she had better endeavor to make Forteau Bay before dark, and anchor there for the night. In light winds or calms, during dark nights or foggy weather, it is better to bring up with a stream anchor, any where in the strait, than to drive about with the tides, without knowing whither; but then a look out must be kept for drifting icebergs.

ISLAND OF ST. PAUL.—Vessels bound to Canada, or to any of the ports in the Gulf of St. Lawrence, should endeavor to make the Island of St. Paul, which, being of considerable elevation and bold all round, may, with care and a good look out, be made at night, or even in fogs, unless the former be very dark or the latter very thick.

On this island there are two light-houses erected; one on the northern extremity, 130 feet high, containing a fixed light; this light can be seen on any bearing, excepting between N. by E. and E. by N., when it is obscured by the hills to the southward of it. The southern light can be seen on any bearing, except between S. S. E. and W., when it is obscured by the hills to the north of it.

This island lies in the main entrance to the Gulf of St. Lawrence, between Cape Ray, at the S. W. extremity of Newfoundland, and Cape North, near the northern extremity of Cape Breton Island. From the south point of the Island of St. Paul, Cape North bears W. S. W. ¼ W. by compass,* distant 13 miles; and from the north point of the same island, Cape Ray bears E. by N., distant 41½ miles. In approaching St. Paul from the S. E. with northerly winds, the current, which is at times coming from the north-

* In these directions all bearings are magnetic, or given by compass, unless when the contrary is expressed.

ward, and setting towards the shore of Cape Breton, should be guarded against. The south coast of Newfoundland, eastward of Cape Ray, is broken, rocky, and dangerous. The tides and currents, being influenced by the winds, are irregular; whilst all southerly and easterly winds, and often also south-westerly winds, bring a thick fog, which is most dense near the lee-shore. On these accounts this coast should not be approached, excepting with a decided northerly wind and clear weather.

St. Paul Island is $2\frac{9}{10}$ miles long, by 1 mile broad. Its N. E. point is a small detached islet, although it does not appear as such from the sea. This islet is separated by a very narrow channel from a peninsula, between 3 and 400 feet high, which, together with the isthmus, is so precipitous as to be nearly inaccessible. The remaining greater part of the island, which is also very steep and precipitous towards the sea, has two parallel ranges of hills, that on the Atlantic coast being the highest, and attaining an elevation of about 450 feet. A valley runs through between these hills, having two small lakes or ponds, 2 or 300 feet above the sea. These supply the principal stream on the island, which is about a fathom wide, of yellowish-brown water, well tasted and wholesome, and descending into the sea in the southern part of Trinity Cove. There are several other, but much smaller, runs of water, one of which is into Atlantic Cove. These two coves are nearly a mile from the S. W. extremity of the island, the first being on the gulf side, and the other on that which is towards the Atlantic, as its name implies. They afford the only shelter for boats, and the only good landing on the island, which is easier of ascent from them than at any other part. Off the two coves just mentioned small fishing schooners anchor, with the wind off shore, in 10 or 12 fathoms, sand and gravel bottom, and at the distance of 2 cables' length from the rocks. In very fine weather, large vessels might venture to ride with a stream anchor, in from 25 to 30 fathoms, about half a mile off shore, but should be in constant readiness to weigh at the first sign of a change in the wind or weather. Further off shore the water becomes extremely deep, as will be seen in the chart, so that there is little or no warning by the lead in approaching this island in foggy weather.

The irregularity of the tidal streams and currents add much to the danger arising from the fogs, which prevail in southerly, easterly, and often also with S. W. winds. During the whole of a fine calm day, at the end of June, we observed the current to set to the S. E., at the rate of one knot, past the north point of the island.

After having made St. Paul, vessels bound to Canada should endeavor, if the weather be clear, to make the Bird Rocks, the largest or south-easternmost of which bears from the north point of St. Paul N. N. W. $\frac{1}{4}$ W., 55 miles.

There is a deep channel between St. Paul and the bank on which the Magdalens, Bryon Island, and the Bird Rocks are situated. This channel is 12 miles wide, and no soundings have been found in it with 60 fathoms of line. Twelve miles N. W. from St. Paul, on the S. E. extremity of the bank above mentioned, there are 50 fathoms of water over a bottom of fine sand; and $13\frac{1}{2}$ miles from the island, on the same line of bearing, there are 35 fathoms, the bottom being the same, with the occasional addition of gravel. From this point the water shoals gradually towards the Magdalens, distant 42 miles. Following the eastern edge of the bank to the northward, inclining gradually to the N. W., regular soundings extend from 28 to 35 fathoms over sand, stones, and broken shells; the latter depth being where the Great Bird Rock bears W. N. W.; and when the same rock bears W. S. W. $\frac{1}{4}$ W., distant $13\frac{1}{2}$ miles, there will be 50 fathoms over fine sand on the edge of the bank, off which there is no bottom with 70 fathoms of line. At the distance of 10 miles from the rock, and on the same line of bearing, there are 43 fathoms; and at 6 miles, 33 fathoms, shoaling gradually in to 24 fathoms, within a mile of the rocks. This bank is an excellent guide up to the Bird Rocks at night, or in thick weather, which almost always accompanies easterly and southerly winds: but under such circumstances it will be safer to run along the northern edge of the bank, taking care not to come into less than 40 fathoms, than to attempt to make the Bird Rocks. When well past them by the reckoning, a course can be shaped up the gulf.

In northerly winds the weather is usually clear; and, if the ship be far enough to windward, it will be advisable to stand to the westward, and endeavor to make Entry Island, taking care to avoid Doyle Reef, and the Sandy Spit off the east end of the Magdalens, by not approaching the islands in that part nearer than 20 fathoms. Under the lee of these islands a smooth sea will be found, sufficient guidance by the soundings, and good shelter and excellent anchorage in Pleasant Bay.

Another advantage of following this course arises from the circumstance that the N. W. winds very generally veer to the S. W., so that, if a vessel has passed to leeward of the Magdalens with the northerly or N. W. winds on the starboard tack, the succeeding S. W. wind will enable her to stand on the opposite tack towards Cape Gaspé.

From the north point of the Island of St. Paul to the east point of the Magdalens, the course is N. W. $\frac{1}{4}$ W., distance 56 miles; and to Entry Island, N. W. by W. $\frac{3}{4}$ W., 63 miles.

From the north Bird Rock the lighthouse on the S. W. point of the Island of Anti-

costi bears N. 46° 13′ W. true, or N. N. W. by compass, 134 miles; and the east point of Anticosti N. 14° 46′ W. true, or N. ¾ E. by compass, 80 miles.

After leaving the Bank of Soundings, northward of the Bird Rocks, the water is very deep all the way until near the shores of Anticosti, there being no bottom with 80 fathoms of line, nor probably at much greater depths. In making this part of the voyage up the gulf, the frequent current from the northward, mentioned as having been one of the causes of shipwrecks in the neighborhood of Capes Rozier and Gaspé, Mal Bay, &c., should be considered. Accidents, however, from this cause can never occur if the lead be used; for, upon consulting the chart, it will be seen that there are soundings to be obtained nearly all the way upon, and to the southward of, a line joining the Bird Rocks and Cape Gaspé, whilst a few miles to the northward of that line there is no bottom with 80 fathoms of line.

With a fair wind the object should be to make the light-house or revolving light upon the S. W. point of Anticosti; and, with westerly winds, any part of the coast of that island which can be attained. When the light-house on Heath Point shall be lighted it will be easy to make the east end of the island at night, if the weather be clear; and, if the weather be thick, the Bank of Soundings, which extends off it 28 miles to the south-eastward, may seem to determine the vessel's position by the lead. At the distance from the island above named there are 62 fathoms of water, shoaling gradually in towards the island, as will be seen by the chart.

In the event of a vessel being near the eastern extremity of Anticosti, and having succeeded in making the east point, or the light on Heath Point, with a S. W. wind, it will often be preferable to proceed to the northward of the island, where there is a good channel, rather than to tack and stand back to the southward and eastward. Under the lee of Anticosti she will, in this case, have a smooth sea, and often also clear weather, whilst there is a heavy swell and frequently a thick fog to windward of it. She will, moreover, avoid the current out of the St. Lawrence, which runs constantly with westerly winds between the south coast and Anticosti, and thus be able, at all times, to make way to the westward in moderate weather. At night, or in foggy weather, the Bank of Soundings off the north coast, and further westward the banks off the Mingan Islands, will safely guide her, even although the land should not be visible.

THE MAGDALEN ISLANDS.—The Magdalens are a chain of islands, assuming an irregular curved direction, the greatest length of which, from the S. W. cape of Amherst Island to the east point, is 35 miles; but if the smaller isles be included, as they evidently form a part of the Magdalen group, the whole length of the range, from the Deadman to the Great Bird Rock, will be 56 miles, in an E. N. E. direction.

There are at present upon the islands about 1100 inhabitants, the majority of whom are of French extraction, and who all inhabit Amherst, Grindstone, and Alright Islands, with the exception of about 11 or 12 families divided between Entry Island, Grosse Isle, and East Island, near the N. E. extremity of the chain. Ships may obtain limited supplies of fresh provisions, especially at Entry Island, and water most readily from Amherst Harbor, either from a spring which issues from under the Demoiselle Hill, or from a small stream which falls into Ance à la Cabane, near the S. W. cape of the island. Wood for fuel is becoming scarce near the settlements. Large spars are not to be had, unless when they chance to be saved from wrecks, but small ones, of spruce and juniper, may be obtained. The latter, of which the inhabitants build their fishing boats and shallops or smaller schooners, somewhat resembles larch wood; it is said to be extremely strong and durable.

When first made from sea, the Magdalens appear like several hilly islands, with channels between, but, on a nearer approach, they are seen to be all connected together, with the exception of Entry Island, by a double line of sand bars and beaches, inclosing extensive lagoons, having very narrow entrances, by which the tide finds access and egress. These sand bars are in some parts only a few feet above the sea, whilst in others they rise into hills of blown sand of considerable elevation. They appear to be increasing, since they are generally ridges of sand with from 9 to 12 feet water parallel to, and from 50 to 100 fathoms outside the beach. There are 3 and 4 fathoms of water between these ridges and the shore, a circumstance which has often proved fatal to the crews of vessels wrecked upon these shores. These hilly islands thus disposed in a curvilinear shape, and connected together by sand bars, inclosing lagoons, reminds one forcibly of those islands in tropical seas which are connected together by coral reefs.

In a bright sunny day of summer, the cliffs of various colors, in which different shades of red predominate, and the yellow of the sand bars contrasted with the green pastures of the hill sides, the darker green of the spruce trees, and the blue of sea and sky, produce an effect extremely beautiful, and one which distinguishes these islands from any thing else in the Gulf of St. Lawrence. In stormy weather, the appearance is equally characteristic. Isolated hills and craggy cliffs are then dimly seen through the rain and mist which accompany an easterly gale, and appear joined by long ranges of breakers, which almost hide the sand-bars. At such times it is dangerous to attempt making the

islands, for in approaching the lower parts, the breakers would probably be the first thing seen from a vessel.

The Magdalens possess no harbor for ships, but three for small vessels, named Amherst, House, and Grand Entry Harbors, which will be noticed in the following concise description of the shores of the islands, and the dangers off them.

The east point of the Magdalens is of low sand, inclosing several shallow ponds, and having several sand hills, some of which are near its extremity, while others, of greater elevation and further to the westward, extend in a chain nearly to the N. E. cape. These last-mentioned sand hills are inland, and on the margin of the north-eastern part of the great lagoon. The N. E. cape is a hill on East Island, which stands at the head of Grand Entry Harbor. It is a very remarkable cape, and its isolated cliffs, being 230 feet high, can be seen over all the sand-hills and sand-bars, so that when these last are below the horizon, the N. E. cape appears to be the eastern extremity of the chain.

LONG SPIT is a ridge of sand, with from 2 to 3 fathoms of water, which extends off the east point S. E. ½ S. rather more than 1½ mile, and for 1¼ mile further in the same direction. the depth is from 4 to 6 fathoms. To clear this spit observe the following remarks and directions. The southern part of Coffin Island is a peninsula, forming the southern shore of the Oyster Pond, and connected to the remainder of the island by a low neck or isthmus at the west end of the pond. Now the mark for the 3 fathoms extremity of the spit is the north side of this peninsula on with the Old Harry Head; and the south side of the northern part of Coffin Island (where the narrow neck joins it, as above mentioned) on with the Old Harry Head, will lead over the spit in 4 fathoms. A person with our charts before him will have little difficulty in making out these leading marks, but may, if he pleases, pass round the spit, by the lead, in 5 or 6 fathoms, taking care not to bring the Old Harry to bear to the southward of west. To know when a vessel from the eastward has passed it, observe that the line of the summit of the north cape on with the east side of the N. E. cape clears it nearly ½ a mile to the S. W., which mark will also be useful to a vessel approaching it from the westward. The tides set rapidly over this spit, and, together with the shoal water, cause a heavy breaking sea. It is extremely dangerous, and vessels should take care not to get becalmed near it without an anchor clear.

DOYLE REEF.—Doyle Reef lies S. ½ E., distant 6¾ miles from the East Point, and consists of pointed rocks. It is very small, being only 300 fathoms long, and 50 fathoms wide, from 6 fathoms to 6 fathoms. The least water is 3 fathoms on one spot nearly in the centre, and there are 12 and 13 fathoms all round it. The only mark for this reef is the North Cape of the Magdalens open two-thirds of its breadth to the N. E. of the North-East Cape. On the reef, the angle between these marks and the western point of Coffin Island is 24° 27′.

Lying completely in the way of vessels, and very seldom showing, the sea breaking upon it only in heavy gales, Doyle Reef may justly be considered as one of the worst dangers off the Magdalens. It has been examined and laid down by us for the first time, and was previously known only to a very few persons on the Magdalens.

OLD HARRY HEAD.—Proceeding to the south-westward from the East Point the first headland is the Old Harry, the S. E. point of Coffin Island, bearing from the E. point W. S. W., by compass, 4½ miles. Between them is a sandy bay, in which vessels may anchor, with good shelter, in all winds from W. round by N. to N. E.: but it is not a place to be recommended, because a vessel would be there very much embayed by the shoals on either side, and might find it difficult to get out on the occurrence of a sudden shift of wind, either at night, or attended with fog.

The Old Harry Head has red sandstone cliffs of a moderate height with a reef off it to the south-eastward one-third of a mile.

COLUMBINE SHOALS.—From the Old Harry 2½ miles S. S. W. ½ W., and S. S. E. by S., 2 miles from the east end of the cliffs, westward of the entrance of the Oyster Pond, lies the outermost of the Columbine shoals, a patch of rocks, with 3 fathoms at low water. Within this, and towards Coffin Island, are numerous small shoal patches and pointed rocks, on some of which there are not more than 3 feet at low water, as will be seen in the chart. These shoals are extremely dangerous, and much in the way of vessels hauling round the east point of the Magdalens with northerly winds. To clear the east side of them, the whole of the high N. E. cape must be kept well open to the eastward of the Old Harry. There are no good marks for clearing the west side, or for leading clear outside of them, so that the only guide for the latter purpose is not to bring the East Point to bear to the eastward of N. E., and, for the former, is not to bring the W. end of Coffin Island to bear to the westward of N. W. ½ N. But although there are no good marks, an angle with a quadrant will answer the purpose as well and as easily. On the outer edge of these shoals, the angle between the Old Harry Head and the left or west extremity of Coffin Island is 77°: consequently, with these points subtending any less angle, the vessel will pass outside of the shoals. Coffin Island extends 4 miles to the westward of the Old Harry, having on its south side a lagoon with a very narrow outlet,

called the Oyster Pond, and which boats can only enter in fine weather. Off the coast of Coffin Island there are several rocks, besides the Columbine Shoals, but as these are in-shore, and out of the way of vessels, it is sufficient to refer to them, and to remark, that this is a very dangerous part of the islands, which should never be approached at night or in foggy weather.

GRAND ENTRY HARBOR.—At the N. W. end of Coffin Island, and between it and the sand-bars to the westward, is the entrance of Grand Entry Harbor, which has water enough within for large vessels, and is superior, in this respect, to any other in the Magdalens. But its entrance is extremely narrow, not exceeding 50 fathoms in breadth, and the narrow channel leading to it, between sandy shoals which are said to shift, extends 1½ mile to the westward. These circumstances render instructions for entering it of no avail. A native pilot should be employed, or the channel buoyed or staked, and even then the entrance should not be attempted excepting with a leading wind, flowing tide, and fine weather. The depth that can be carried in, at low water, is 10 feet: at high water, neap tides, 12 feet; and in spring tides, 13 feet. There are 28 feet water at, and immediately within, the entrance. The ebb tide runs out with great rapidity, and the flood in is also strong. There are no settlements at Grand Entry Harbor, but there are a few families in the vicinity of the N. E. cape, who breed cattle, and are of British extraction.

Within this harbor there is a large expanse of water, from 1 to 3 fathoms deep, extending north-eastward to the southern shores of Grosse Isle, and communicating by a very narrow channel with a large shallow pond, which washes the base of the N. E. cape, and extends to within about 2 miles of the eastern extremity of the chain. This great lagoon also extends south-westward, between a double line of sand-bars, to the eastern shores of Grindstone Island, and is, in all, 23 miles long, and from half a mile to 3 miles wide. Throughout its whole extent there is a communication for boats, at high water, perfectly sheltered from the sea. There are, at present, 3 entrances into this lagoon from the sea, namely: Grand Entry Harbor, already mentioned; another 3½ miles to the westward, which is very shallow; and House Harbor, near its S. W extremity, between Alright and Grindstone Islands. There were formerly others, which have been closed since the time of Des Barres, 1778: and, on the other hand, the second, mentioned above, has opened since his time.

SHAG ISLAND.—Shag Island is small and low, and of sandstone, lying about half a mile from the sand-bars, nearly midway between Coffin and Alright Islands, and out of the way of vessels.

CAPE ALRIGHT.—Cape Alright bears from the Old Harry Head, S. 72° W., 16½ miles. It is the southern point of Alright Island, and a very remarkable headland. The cliffs, of a greyish white color, with occasional brick-red low down, are 400 feet high, at the highest part, which is about a mile to the eastward of the cape, and those to the westward of the cape, towards House Harbor, are also very high, and of the same color.

ALRIGHT SUMMIT.—Nearly a mile inland is the summit of Alright Island, 420 feet above the sea. Between this summit and the cape there is a very remarkable hill, named Bute-Ronde. The south extremity of the cape is low, with a small rock close off it.

ALRIGHT REEF.—Alright Reef lies S. 80° E. 3¼ miles from Cape Alright to the outer edge of the reef, which is 400 fathoms long, by 300 fathoms wide. It is of white and pointed rocks, having over them 6 feet least water. On this reef the Bute-Ronde is on with the summit of Grindstone Island; the west side of Cape Alright is on with the west side of Cape Moule: and the whole of the woody Wolf Island is just open to the westward of Shag Island. Therefore, to clear the S. W. side, keep the well marked summit of Grindstone Island open to the south-westward of Cape Alright; and to clear the south-eastern side of this reef, keep the east side of the woods of Wolf Island (seen over the sand-bars) open to the eastward of Shag Island.

The N. E. point of Entry Island bears S. ½ E. 7 miles from Cape Alright; and the channel between them leads into Pleasant Bay, passing previously between Alright Reef and the Pearl Reef.

PEARL REEF.—The Pearl Reef is small and dangerous, and of white pointed rocks, like most of the reefs round these islands. It is round, and about 200 fathoms in diameter, with 9 feet least water. It bears S. 41° E. 8¼ miles from Cape Alright; and N. 80° E. 4½ miles, from the N. E. point of Entry Island. Even with a moderate swell the sea breaks heavily upon it. The marks on this reef are the Demoiselle Hill, open one quarter of a point to the northward of the cliffs of Entry Island, and exactly on with the extremity of the N. W. spit, above water, of the same island. This spit, however, can be seldom seen from the reef. The cross mark is the three high cliffs, on the S. W. side of Alright Island, nearly in one, bearing N. 44° W., when the north-westward of those cliffs will be seen over the middle one, and between it and the south-eastmost. Hence, keeping all those cliffs open will clear the reef to the westward, and the north-westmost cliff completely shut in behind the other two will clear it to the eastward. The Demoiselle Hill shut in behind the north side of Entry Island will clear it to the southward; and, lastly,

the Demoiselle kept more than half a point open to the northward of Entry Island will clear it to the northward.

To the N. W. of Cape Alright, and distant $2\frac{3}{4}$ miles, is the entrance of House Harbor, a narrow and crooked channel, with only 6 feet at low water.

RED CAPE.—From Cape Alright, S. 80° W. 5 miles, across the bay in which is the entrance of House Harbor, brings us to Red Cape, the southern point of Grindstone Island, and the north point of Pleasant Bay. The opposite point of the bay, Sandy Hook, is the east point of Amherst Island, and bears from the Red Cape S. by E. $\frac{1}{2}$ E., 6 miles. From this line to the shore of Amherst Island at the head of the bay, the distance is $4\frac{1}{4}$ miles. Between Red Cape and House Harbor is Cape Moule, of grey sandstone, off which there is a rock, with 5 feet of water; and there is another rock, with 3 feet, off the west side of Alright Island. These will be seen in the chart, and as they lie out of the way of vessels, require no further notice.

GRINDSTONE ISLAND.—Grindstone Island is the second largest of the chain, being, in this respect, intermediate between Amherst and Alright Islands. Its summit is elevated 550 feet above the sea at high water.

AMHERST ISLAND.—Amherst Island, the largest and south-westernmost of the Magdalens, is connected with Grindstone Island by a double line of sand-bars, inclosing an extensive lagoon, 5 or 6 miles long, and from 1 to 3 miles wide, the southern part of which is called Basque Harbor. This lagoon is full of sands, which dry at low water, and has 30 outlets into Pleasant Bay, the southernmost being the deepest, but having only 3 feet water over its bar at low water. The others, including three through the sand-bars of the N. W. coast, will only admit boats at high water, and when the surf is not too high.

The hills in the interior of Amherst Island rise to the height of 550 feet above the sea. Towards the south-east part of the island, and about a mile to the N. W. of Amherst Harbor, is the very remarkable conical hill, named the Demoiselle, of trap rock, and 280 feet high. The perpendicular and dark red cliffs of the Demoiselle are washed by the waters of Pleasant Bay.

AMHERST HARBOR.—Amherst Harbor is formed by a peninsula, presenting cliffs of grey sandstone to seaward, in the S. E. corner of Pleasant Bay. Its entrance, between this peninsula and the sands to the southward, is $2\frac{1}{3}$ miles within, or to the westward of the extremity of Sandy Hook, which is a long and narrow sandy point with sand-hills. This harbor is the easiest of access and egress of any in the Magdalens, and has, moreover, the advantage of an excellent roadstead outside, where vessels may wait their opportunity of running in. Nevertheless, its entrance is extremely narrow and rather crooked, so that, without a pilot, it would be necessary to buoy or stake the channel. The depth over the bar, which is rocky, is 7 feet at low water, and from 9 to 10 feet at high water, according as it may be neap or spring tides. Within the harbor there are from 12 to 17 feet, over a bottom of soft, black, and fetid mud, well sheltered from every wind.

PLEASANT BAY.—Pleasant Bay is the best roadstead in the Magdalens, and the only one where vessels can venture to lie with all winds, during the three finest months of summer, June, July, and August. In those months, a gale of wind from the eastward, so heavy as to endanger a vessel with good anchors and cables, does not occur above once in 3 or 4 years. The riding, however, is often heavy and rough enough in north-east gales, and a vessel should be well moored with a whole cable on each anchor, an open hawse to leeward, and all snug aloft.

The best and most sheltered anchorage is in 4 fathoms, with the rocky point of entrance of Amherst Harbor bearing S. W. $\frac{1}{2}$ W., two-thirds of a mile, and a little more than half a mile from high water mark on the sandy beach to the southward, when a remarkable and high sand-hill will bear S. $\frac{1}{2}$ E. A large ship should anchor further off, and should take notice that there are only from 3 to $3\frac{1}{2}$ fathoms in one part of the bay, as will be seen in the chart. The bottom is every where excellent for holding, and of red sandy clay. A vessel, anchored as I have recommended, will be sheltered from E. N. E. $\frac{1}{2}$ E. round by the southward and westward to N. E. $\frac{1}{2}$ N., and will, consequently, have only 3 points completely open. Even when the wind comes right in, the sea is much lessened by passing over so much of shoal water; nevertheless, I am of opinion, that the attempt to ride out a heavy easterly gale, either before June, or after August, would be attended with great danger, and do not recommend Pleasant Bay as a pleasant place under such circumstances at any time of the year. In the northern and western parts of the bay, sandy flats extend more than a mile from the beach.

SANDY HOOK CHANNEL.—From the Sandy Hook to the N. W. point of Entry Island, the bearing is E., by compass, $2\frac{1}{2}$ miles. There is an extensive flat sandy shoal running out two miles from Sandy Hook towards Entry Island, which last has also rocky shoals off its west side. Sandy Hook Channel, between them, is two-thirds of a mile wide, and 4 fathoms can be carried through it by a good pilot, but $3\frac{1}{2}$ fathoms is the utmost that can be safely reckoned on by a stranger. There are several rocky patches of

2½ fathoms off the S. W. point of Entry Island, reaching to fully three-quarters of a mile from the shore. The ebb tide sets strongly through this channel, and over Sandy Hook Flat, so that large vessels should go round to the eastward of Entry Island rather than encounter so many difficulties. To run through Sandy Hook Channel from the sea, keep the east side of Alright Island just open to the westward of the shingle and sandy spit forming the N. W. point of Entry Island, until abreast of the S. W. point of the last named island, then haul up for the summit of Grindstone Island, looking out for the edge of the land shoal to the westward, which can generally be seen.

ENTRY ISLAND.—Entry Island is the highest of the Magdalens, its summit being 580 feet above the sea at high water. Its red cliffs are magnificent and beautiful, rising, at the N. E. point, to 350 feet; and at the S. point to 400 feet of perpendicular height. Off the N. E. point there is a high rock about half a cable's length from the cliffs, and on its north side the remarkable Tower Rock of red sandstone, joined to the island, and which can be seen from the S. W. over the low N. W. point, as well as from the N. E.

Vessels occasionally anchor under Entry Island in northerly and easterly winds, but it is rough riding, by reason of the sea which rolls round the island.

The inhabitants of Entry Island raise cattle and sheep, depending more upon the sale of fresh provisions than the fisheries. Vessels may, therefore, almost always obtain supplies.

From Sandy Hook the south coast of Amherst Island, consisting of sand-hills and beaches, with shoal water half a mile off, curves round to the westward, for 6 or 7 miles, to the entrance of a basin, which extends nearly across the island to within less than half a mile of Pleasant Bay. The Basin is now so nearly closed with sand, that boats can only enter at high water, and in the finest weather; but, formerly, the entrance was deep enough for large schooners, and it has been frequented by those vessels within the memory of the elder inhabitants.

There is good anchorage off the entrance, in from 6 to 9 fathoms, sandy bottom, and with winds from N. W. round by north to east.

AMHERST CLIFFS.—A mile and a half to the westward of the entrance of the basin, cliffs commence and continue, except in Cabane Bay, to the west cape, which is the highest cliff of Amherst Island, its summit being 300 feet above the sea. There is a remarkable rock above water close to the shore, and about a quarter of a mile to the southward of it.

CABANE BAY.—Cabane Bay is a small bight, between the south and S. W. capes of Amherst Island, where vessels may safely anchor with northerly and easterly winds, and where good water may easily be obtained. The best berth is in 8 or 9 fathoms, sandy bottom, off the centre of the bay, with the south cape and Cape Percé in one, three-quarters of a mile off shore.

From the west cape, the remainder of the sea-coast of Amherst Island consists of red cliffs, without beach, but having shoal water one-third of a mile off shore, all the way to West Lake, a small pond at the S. W. end of the sand-bars, which join Amherst and Grindstone Islands. At the N. E. extemities of these sand-bars is Gull Islet, which is small, rocky, and close to the western point of Grindstone Island, and has shoal water off its west point to the distance of one-third of a mile. About 1½ mile south-westward of it, nearly 1¼ mile off the N. W. outlet of Basque Harbor, and with the west side of Gull Islet and Gros Cap in one, lies a rocky shoal with 3 fathoms at low water, and leaving no good passage between it and the shore. Close to the N. E. of Gull Island is the Etang du Nord, a small islet affording good shelter to boats.

HOSPITAL ROCK.—The northern shore of Grindstone Island is of red sandstone cliffs, less high than those of Amherst Island. Near their N. E. extreme lies the Hospital Rock, close to the shore, and also some rocky 3 fathoms patches, more than half a mile from the shore, as will be seen in the chart.

WHITE HORSE.—The White Horse is the name of a very dangerous reef, lying N. 60° E., 7 miles, from Deadman Islet; and due W. N. W. 5½ miles from Cull Islet. It is extremely small, being scarcely more than a cable's length in diameter; and having 10 feet least water over pointed rocks, on which the sea often breaks. On this reef the summit of Entry Island is seen over a low part of the sand-bars at the N. E. outlet of Havre Basque, but this mark cannot be easily discerned by a stranger, nor is there any other; but the bearings and distances, together with the chart, will be a sufficient guide. To those that can take a terrestrial angle with a quadrant, a matter so simple that it is astonishing that it is not more generally known and practised, the following may be of use. When on the reef the western extremity of Amherst Island and Hospital Cape (the north-eastern extremity of the cliffs of Grindstone Island) subtend an angle of 91° 30′; consequently with these points subtending a less angle by 3 or 4 degrees, the vessel will pass outside of the reef. With a greater angle, 94 or 95 degrees, she will pass inside of it, or between it and the shore.

There are irregular soundings and foul ground between this reef and the shore, but nothing less than 5 fathoms, excepting what has been already mentioned.

The Pierre de Gros Cap is another dangerous reef of rocks, nearly of the same size as the White Horse, and having 18 feet least water. This reef is seldom seen, as the sea breaks upon it only in very heavy weather. It lies N. 62° E. 6 miles, from the White Horse; due north from the west point of Etang du Nord; N. 56° W. from Hospital Cape, and 3⅔ miles off Cape le Trou, the nearest point of Grindstone Island. The marks on this reef are—First, The summit of Alright Island seen over the N. E. point of Grindstone Island, which is in the lagoon, and very nearly on with Hospital Cape. Secondly, the Bute de Portage, a hill of Amherst Island, situated about 1½ mile N. W. of the Demoiselle, midway or in the centre of the narrow passage between Gull Island, and the west point of Etang du Nord. These marks kept open will clear the reef to the N. E. and S. W., and a vessel will pass well clear outside of it, and also of the White Horse, if Deadman Islet be not brought to bear to the westward of S. W. ½ W.

From Hospital Cape to Wolf Island, off which there is a rocky 3 fathom shoal nearly half a mile from the shore, the northern coast of the Magdalens consists merely of sand-beaches and sand-hills for a distance of 9 or 10 miles. The low sandstone cliffs of Wolf Island, which is about three-quarters of a mile long, interrupt the continuance of the sandy shore for only half a mile; the sand beaches then recommence, and continue, with high sand hills occasionally, 9 or 10 miles further, to the north cape. In all this part the sand-bars may be safely approached by the lead as near as 9 or 10 fathoms of depth of water.

NORTH CAPE.—The North Cape of the Magdalens is the northern point of Grosse Isle, and a precipice of considerable height, but not so high as the west point of the same island, which is in the great lagoon, and 300 feet above the sea.

NORTH CAPE ROCKS.—The north Cape Rocks, some of which always show, lie to the westward of the cape, the outermost being 600 fathoms off shore. The west end of these rocks bears S. S. E. from the high S. W. side of Grosse Isle, and their extent to the eastward is marked by the N. E. sides of the north and N. E. capes in one. Therefore, in running down from the westward to anchor under the north cape, do not come nearer to the shore than 1 mile until the above named marks open. In this anchorage, namely, to the eastward of the north cape, vessels may ride in 8 or 9 fathoms, over sandy bottom, with all southerly winds, and will find good holding ground, and plenty of room to get under weigh. Water may be had in small quantities near the houses on the east side of the north cape, but there are no good watering-places excepting those already mentioned.

The coast continues from the north cape, in a curved line of sand-beaches and sand-hills, for about 6 miles, which distance again brings us to the east point, and completes the description of the Magdalens.

Although I have given a general description of the appearance of the Magdalens, yet as vessels passing to the southward of them have been directed to endeavor to make Entry Island, it may be useful to add, that that island, when first made from the eastward, will appear like a double peaked hill, sloping somewhat abruptly down to perpendicular and high cliffs on either side. The S. W. point of Amherst Island is also a steep cliff, but of less height, and as there is no land to the southward and westward of it, it cannot be mistaken. The land rises from it in undulations to the highest parts of the island. Should the weather be foggy, the soundings, as shown in the charts, will safely guide vessels passing to the south-eastward of the islands. The general soundings around the Magdalens, which extend off them so many miles in every direction, and which have now for the first time been correctly laid down by us, thus affording an invaluable assistance to vessels at night or in foggy weather, will be better understood from the charts than by any written directions.

TIDES AND CURRENTS.—I have now only to notice the important subject of the set of the currents or tidal streams around these islands, respecting which I can say nothing that will not be subject to exception, for they are so irregular, that the most experienced and intelligent pilots for the islands, who are also fishermen, who have passed their lives in fishing craft around them, can give no certain account of their rate and direction, but all agree in stating, that they vary in both respects, either from the effects of winds, or other and unknown causes.

Nevertheless, the following observations will hold good as a general rule, and although subject to occasional interruption, the set of the tidal streams, which I am about to describe, will be found to recur with considerable constancy in fine weather.

A few miles outside of Bryon Island and the Bird Rocks, there appears to be usually a current setting to the south-eastward, out of the gulf; but the stream of flood tide flows between them and the Magdalens. The stream of flood comes from the S. E., and is divided by the east point of the Magdalens. One branch of the stream sets strongly over the Long-spit, which, with the Old Harry Head and the shoals off it, turn it off to the south-westward towards Entry Island, leaving nearly slack water in the bay between Coffin Island and Cape Alright, and also in Pleasant Bay. The other branch, to the northward of the islands, follows the shore from East Point round to the south-west cape

of Amherst Island, whence the greater part of the stream continues its course to the S. W.; whilst the remainder, following the shore, runs round and along the southern coast of Amherst Island, until it meets the before-mentioned other branch of the stream from the east point setting off the east side of Entry Island; it is overcome by this other branch and turned gradually round to join the general weak stream of flood to the westward in the offing.

EBB STREAM.—On the S. E. side of the islands, the stream of the ebb tide sets strongly out of the lagoons and out of Pleasant Bay, between the Sandy Hook and Entry Island. It is also often found running to the westward along the southern shores of Amherst Island, and right round it in like manner, but contrary in direction, to the course of the flood already described. In the offing, at the same time, the stream of ebb is from the S. W., and sets over the sandspit off the Sandy Hook Point, where it meets the stream from the N.W., which has followed the north shore of the islands, round from Amherst Island to the east point. The meeting of these two streams of the ebb tide, together with the shoalness of the water, causes so heavy a breaking sea in strong easterly winds, that the fishing shallops dare not venture at times to pass the point.

The rate of either stream seldom amounts to a knot, excepting close in shore, or round the points. The ebb, however, is generally the strongest stream, and its rate is increased by westerly wind, as is that of the flood by winds from the eastward.

DEADMAN ISLET.—The Deadman bears N. 52° W., 7¾ miles nearly, from the west cape of the Magdalens, and is very small, being not more than 300 fathoms long, in an E. S. E. direction, and less than half that breadth. It is about 170 feet high, with steeply sloping sides, meeting at the summit like a prism, so that when seen end on, it resembles a pyramid. When seen from a distance, with its longest sides presented to view, its outline very much resembles that of a body laid out for burial, from which circumstance its name is derived. It is composed principally of trap rocks, and when seen close to, on a bright sunny day, with the white surf dashing against its variously colored sides, it is a very beautiful object. It is so bold on the west side, that a vessel may pass within a couple of cables' length with perfect safety, but a reef extends towards Amherst Island one-third of a mile.

About a mile to the northward of it there is a rocky fishing ground with 8 fathoms least water; and 6 miles S. S. W. ½ W. of it, there is another with 11 fathoms. There is no danger nearer than the "White Horses," to be mentioned hereafter, and vessels may safely pass between it and Amherst Island. It is, however, much in the way of vessels passing round the west end of the Magdalens, and they should beware of it at night, or in foggy weather, for the lead will give little warning, since there is nearly as much water within half a mile of it, as at the distance of several miles.

BRYON ISLAND, which is uninhabited, is rather more than 4 miles long, in a W. by N. and E. by S. direction, with the extreme breadth of rather more than a mile. Its eastern end bears from the east point of the Magdalens, N. by E. ½ E. 10½ miles, but its S. W. point approaches to within 8¾ miles of the north cape of these islands.

A great part of the island is wooded with dwarf spruce trees, and there is a large upland tract covered with good native grass. Water is neither plentiful nor easy to be obtained, but it may be had in small quantities by digging, and there is a spring on the north side of the narrow isthmus which joins the eastern peninsula to the remainder of the island.

I had no opportunity of measuring the height of Bryon Island, but I conceive it nowhere exceeds 200 feet above the sea. The cliffs on the north side are much higher than those on the south, where there are several small coves in which boats may land easily with the wind off shore. There are three reefs off Bryon Island. One off its east end extends near three-quarters of a mile to the north-eastward: another off the west end extends 1½ mile to the westward, and the third, off the sandy S. W. point, 1¼ mile to the southward. No marks can be given for clearing these reefs, but the bearings of the land, as shown in the chart, will afford sufficient guidance to the seaman. The reef off the S. W. point is so much in the way of vessels passing between it and the Magdalens, that it may be useful to add, that from the southern ridge of this reef, Bryon Island subtends an angle of 97°, so that with the island subtending any less angle the reef may be passed. The south reef assists greatly in turning off the sea from the roadstead to the eastward of it, where vessels may safely anchor in 6 fathoms water and a sandy bottom, at the distance of a mile or more from the shore, and with all winds from N. E. round by N. to W. N. W. Small vessels in heavy N. W. gales lie at anchor close under the reef.

There are regular soundings, from 9 to 11 fathoms, with sandy bottom, between Bryon Island and the Magdalens, with the exception of an extensive patch of foul and rocky ground, lying between S. W. ½ W. and W. S. W. from the west end of Bryon Island, and having a clear channel on either side of it, as will be seen in the chart. We could find no less than 5 fathoms here, and although the fishermen see bottom upon it in calm weather, I have every reason to think that there is no less water. Nevertheless, large ships had better not run over it when there is a heavy sea running, for a small point of rock, with a few feet less water, might escape the most rigorous examination.

These rocky places are called fishing grounds by the inhabitants of the Magdalens, because codfish abound upon them. There is one with 11 fathoms of water $2\frac{1}{2}$ miles north of Bryon Island, and which extends a considerable distance parallel to the island. There is sandy bottom, and a greater depth of water within this ridge, and vessels may anchor, in fine weather and southerly winds, off the bay on the north side of the island. The soundings extend so far off Bryon Island to leeward in every direction, that there is no possibility of a vessel on a voyage being endangered by it, if the lead be used. But great caution is requisite in approaching the reefs, for they are very steep, especially that which extends to the southward.

THE BIRD ROCKS are of coarse red sandstone, or conglomerate, in strata dipping very slightly to the S. W., and are constantly diminishing in size from the action of the sea. They present perpendicular cliffs on every side; yet it is possible to ascend them, with great difficulty, in one or two places, but there is no landing upon them except in the calmest sea. Every ledge and fissure of the cliffs are occupied by gannets, and the summits of both rocks are literally covered with them. The white plumage of these birds gives these rocks the appearance of being capped with snow, and renders them visible, through a nightglass in a clear and moonlight night, from the distance of 7 or 8 miles.

The two rocks bear from each other N. N. W. $\frac{1}{2}$ W. and S. S. E. $\frac{1}{2}$ E., and are 700 fathoms apart. Sunken rocks leave only a boat passage between them. The southeasternmost is the largest and highest, though scarcely 200 fathoms long, and not more than 140 feet high above the sea. The other is divided into two precipitous mounds, joined together by a low ledge. The lesser of these mounds resembles a tower. A reef extends 700 fathoms to the eastward, from the Little, or N. W. Bird Rock, and there is a patch of breakers nearly midway between the two, and rather to the S. W. of a line drawn from one to the other. The Great, or S. E. Bird Rock, is quite bold, excepting in the direction of the other rock. The Little, or N. W. Bird Rock, bears N. E. by E. $\frac{1}{4}$ E., distant $16\frac{1}{4}$ miles from the east point of the Magdalens, and E. $\frac{1}{2}$ S., $10\frac{3}{4}$ miles from the east end of Bryon Island.

The soundings off the Bird Rocks to the eastward have been already stated, in the description of St. Paul; they extend still further off to the northward, so as to afford the most ample warning and assistance to vessels at night, or in foggy weather, as will be seen in the chart. Between them and the east point of the Magdalens, the depth nowhere exceeds 16 or 17 fathoms, over a bottom of reddish sand, and sea-eggs are very frequently brought up by the lead.

Between the Birds and Bryon Island, there is a ridge of rocky and foul ground, on some parts of which, it has been said, there is as little as 4 fathoms of water, because bottom has been seen in calm weather. We, however, could not find less than 7 fathoms, but it may nevertheless exist, so that a large ship had better not cross this ridge when there is much sea running. The two cliffy points, on the north side of Bryon Island, in one, mark the northern limits of this rocky ground.

ANTICOSTI ISLAND.—The Island of Anticosti, situated in the entrance of the N. W. arm of the Gulf of St. Lawrence, is 122 miles long, 30 miles in extreme breadth, and about 270 miles in circumference, following the coast from point to point across the bays.

Its shores are every where of rock, belonging to one great formation, namely, a very ancient secondary limestone, affording in some parts excellent building stone, of which the two light-houses have been constructed.

Streams of excellent water descend to the sea on every part of the coast. They are generally too small to admit boats, becoming rapid immediately within their entrances, and even the largest of them, Observation River, to the westward of the S. W. point, is barred with sand, excepting for short intervals of time after the spring freshets or heavy rains.

Many of these streams abound with trout, and are visited periodically by great numbers of salmon, which are taken by the 2 or 3 resident families, and salted for the Quebec market.

Anticosti is estimated to be nowhere higher than 700 feet above the sea. Its south coast is low and shelving, with reefs of flat limestone which dry at low water. There is, however, a range of highlands in rear of the S. W. point, and extending for some miles both to the north-westward and south-eastward of it. The north coast, for 70 or 80 miles to the westward of the east point, is bold, precipitous, and of considerable elevation. Picturesque headlands, the eastern terminations of parallel ridges of table land, that rise gently with the strata from the S. W., end in magnificent cliffs of limestone, which are externally so nearly white from the effects of weathering, as to resemble chalk. Some of these cliffs are upwards of 400 feet in perpendicular height. The remainder of the north coast is low, with reefs of flat limestone, like the southern shores.

It is unusual to find an island so large as Anticosti without a good harbor. Limestone coasts are in general characterised by deep inlets and bays, peninsulated points, and detached islets and rocks, but nothing of the kind will be found here, and there is not a single detached shoal off any part of the coasts.

This island has been generally believed to be extremely dangerous. Its reefs of flat

limestone, extending in some parts to 1½ mile from the shore, the want of anchorage off most parts of the coast, and above all the frequent fogs, justify this belief in part, but not in so great a degree, as to render reasonable the dread with which it seems to have been occasionally regarded, and which can only have arisen from the natural tendency to magnify dangers of which we have no precise knowledge.

The people in charge of the light-houses and provision-posts, and one man at Fox Bay, are the only resident inhabitants of the island. The provision-posts have been established by the government and legislature of Lower Canada, for the relief of the crews of vessels wrecked upon the island. Vessels are more frequently lost here in the bad weather at the close of the navigable season, than at other times, and their crews would perish from want and the rigors of a Canadian winter, if it were not for this humane provision. The first of these posts is at Ellis Bay, the second at the light-house at the S. W. point, the third at Shallop Creek, (sometimes called Jupiter River,) and the fourth at the light-house on Heath Point.*

The light-house on the extremity of the S. W. point, has been built of a very beautiful greyish-white encrinital limestone, quarried on the spot. The tower is of the usual conical form, and 75 feet high. The light, which is bright, and revolves every minute, can be seen from N. N. W. round by west and south to S. E. by E. The lantern is elevated 100 feet above the sea at high water; consequently the light can be seen from a distance not exceeding 15 miles, when the height of the observer's eye is 10 feet above the sea. When the height of the eye is 50 feet, the greatest distance from which the light can be seen will be about 19½ miles, and if the eye be elevated 100 feet the light will be visible as far off as 23 miles nearly, in the average state of the refraction. Hence by ascending the rigging till the light just shows above the horizon, and then measuring the height of the eye above the sea, a very near estimate of the vessel's distance at night may be obtained. This light-house, and attached provision-post, are in charge of Lieutenant Harvey, on the half-pay of the navy.

The other light-house, on the southern extremity of Heath Point, is of the same form, dimensions, and color as the above, and is also built of the island limestone. It has not as yet been lighted, from want of funds, but is intended to show a bright fixed light from W. N. W. round by S. to N. E. by N. The lantern will stand 100 feet above the sea.

Having given this general description of the island, I will now notice more particularly its shores, reefs, and anchoring places.

EAST CAPE.—The East Cape of Anticosti is a perpendicular cliff of limestone, rising to the height of 100 feet above the sea. The ridge, of which it is the south-eastern termination, trends to the westward inland, and the extremity of the very low land to the southward of it is Heath Point, on which is the light-house, bearing from the east point S. W. ¼ S. 3¼ miles. Between the 2 points is Wreck Bay, which is dangerous and affords no anchorage. Off to the S. E. from the east cape a reef extends rather more than one-third of a mile.

HEATH POINT.—Heath Point is of limestone, about 10 feet high, with a superstratum of peat, in which there are several ponds of dark bog water. Being so low, this point disappears below the horizon at the distance of a few miles, the light-house then appears like a sail off the island, and is extremely useful in marking the extent of the low land to vessels, either from the eastward or westward, as well as in showing its position from the southward, from which direction it cannot be made out at night, being hidden by the high land behind, or to the northward.

The most dangerous reef off this end of the island, runs out from Heath Point to the E. S. E., nearly 2 miles, at which distance there are 5 fathoms of water. Within that distance the reef is composed of large square blocks of limestone, with very irregular soundings, varying from 2 to 5 fathoms. The rocky and irregular soundings, from 5 to 7 fathoms, extend nearly 3 miles off Heath Point, so that I recommend vessels not to approach nearer, on any bearing from the point between S. E. by S. and E. by S. With the east cape bearing N. by W., the vessel will pass just outside of the shallow and irregular soundings in about 20 fathoms of water.

Off Heath Point, to the southward and westward, the shoal water does not extend beyond three-quarters of a mile, and further off on that side there is one of the best open anchorages on the island. The best berth is in 10 fathoms, over sand and mud bottom, with the light-house E. by N., and Cormorant Point nothing to the westward of W. N.

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* There are direction boards erected on the shore, or nailed to trees, from which the branches have been cut off, near the beach, and on various parts of the coast. These direction boards are intended to point out to ship-wrecked persons the way to the provision-posts. The direction boards were placed on the following parts of the shore, as I find from Mr. Lambly's remark-book, for I have not seen them all:—1st. On the west point. 2nd. Four leagues south-eastward of Ellis Bay. 3rd. Ten leagues westward of Shallop Creek. 4th. Seven leagues eastward of Shallop Creek. And there were formerly others on Heath Point and the S. W. point, which the light-houses have rendered unnecessary.

W. The vessel will then be 2 miles off shore, and will be sheltered from all winds from W. N. W. round by the N. to E. by N.

CORMORANT POINT.—From Heath Point Cormorant Point bears W. by N., 6 miles; and the south point bears W. N. W. 16½ miles from Cormorant Point. In this distance the coast is low, and undulating, with points of low limestone cliffs, and beaches of sand and shingle in the bays, inclosing large ponds or lagoons, into many of which the tide flows, and also small streams from the interior of the island. This part of the coast may safely be approached by the lead. as will be seen in the chart, for the reefs no where extend further off than three-quarters of a mile till we come to the South Point.

SOUTH POINT.—The South Point is a cliff of sandy clay, resting upon limestone. It is estimated not to exceed 60 feet in height, and there is nothing remarkable in its shape; but there is no other clay cliff near it, and as it is an extreme point, there will be little difficulty in distinguishing it by the trending of the land. The reef off it to the southward, runs out nearly 1½ mile, and the sea usually breaks upon it. The light on Heath Point and Cormorant Point in one, bearing E. by S., clear this reef at the distance of 2 miles, but I fear that the light will seldom be seen up to the reef, which is distant 22 miles from it. The leading mark will nevertheless be of use to vessels between South Point and Cormorant Point.

From South Point to the light-house on the S. W. point, a distance of 56 miles, there is such a sameness in the character of the coast, that it is very difficult to make out one part from another.

The houses, however, of Mr. Hamilton, in charge of the provision-post at Shallop Creek, will be seen 13 miles north-westward of the south point, and at the first limestone cliff to the north-westward of those houses is Pavilion River, 24 miles from South Point. In this distance the coast is very low, and may be approached safely by the deepsea lead, the soundings in moderate depths extending from 5 to 8 miles off, as will be seen in the chart. The coast begins to rise at Pavilion River, there being a high ridge close in rear of the coast all the way to the S. W. point, and beyond it for some miles. This distance of 32 miles, between Pavilion River and the S. W. point, comprises the boldest parts of the south coast of the island, but should be very cautiously approached in foggy weather, as there is little or no warning by the lead. When far enough to the westward, the light on South-west Point bearing nothing to the westward of N. N. W., as before directed, will be a sufficient guide.

In the whole distance from South to South-west Points, the reefs nowhere extend further off from high water mark than one mile, and the island may therefore be safely approached to within 2 miles.

SALT-LAKE BAY.—Eleven miles south-eastward of South-west Point, is Salt-Lake Bay, which has fine sandy beaches, enclosing lagoons or ponds, into which the tide flows. Off the centre of this bay, and with its N. W. point bearing N. by E. ½ E., distant 1¾ mile, there is very indifferent anchorage, in 7 fathoms, over sandy bottom. Vessels should be careful not to anchor further to the southward and eastward, since there is some foul and rocky ground about a mile in that direction from the position which I have recommended. There are 7 fathoms, rocky bottom, marked in the chart on the spot to which I allude, and there is probably less water between it and the south-eastern point of the bay, so that no one should attempt to pass between it and the shore.

The S. W. point of Anticosti is a low projecting ridge of limestone, having a small cove on its north side, which forms it into a peninsula. The land rises gradually, in the rear of this, to the summit of the ridge above-mentioned. On the south side of the point there is a beach of limestone gravel on which boats may land, as well as in the cove on the north side, when the wind is off the land, and the sea smooth. On the north side of the point, and for several miles along the coast, to Observation River, the cliffs are perpendicular and washed by the sea. The light-house stands on the western extremity of the point, and forms a very conspicuous land-mark. A reef extends out from the point, to the W. and S. W., not more than half a mile; and 2 miles off, in the same direction, there are 30 fathoms, over rocky bottom, deepening rapidly to 65 fathoms, with sand and shells, at the distance of three miles. At the distance of 6 miles, to the southward and westward of the point, the depth is about 110 fathoms, with mud bottom, and increases to 200 fathoms nearly midway towards the south coast.

There is a bay on the north side of the point, in which vessels may anchor in 12 or 13 fathoms, over a bottom of sand, gravel, and broken shells, and with the extremity of the point bearing S. S. W. ½ W., distant three-quarters of a mile, when the cliffs to the eastward will be at the same distance. The shelter is from N. by E. round by E. to S. by W., and small vessels may lie close under the point, but it is a dangerous state to be caught in by westerly winds, which are preceded by a heavy swell. The ground, I think, is not to be trusted, so that, altogether, I do not recommend any vessel to anchor here unless in case of necessity.

There is no anchorage from South-west point to Ellis Bay, and as I have already given directions respecting this part of the western coast, little remains to be noticed. The

reefs of flat limestone extend from it, in most parts, fully a mile; and often have 10 or 12 fathoms of water close outside of them; but vessels, with the lead going, may safely stand in as near as 2 miles, or, which will be safer than an estimated distance, had better tack in 17 fathoms.

OBSERVATION RIVER.—Observation River, 5½ miles northward of South-west Point, is the largest stream on the island, having 5 or 6 feet of water in the entrance after the melting of the snows in the spring of the year, but soon becomes barred with sand by the S. W. gales. It becomes shoal and rapid immediately within, though it has a course from the eastward of many leagues. Its source does not appear to be known to the people of the island. Immediately to the northward of this river there are very conspicuous and high sandy cliffs. The St. Mary cliffs, 21 miles from South-west Point, are also of sand, less high, and less remarkable, but yet not difficult to distinguish.

BESCIE RIVER.—Bescie River is a very small stream, at the head of a small cove, affording shelter to boats, and where there is a hut, at which a hunter and fisherman occasionally resides. It is 7 miles north-westward of the St. Mary Cliffs, and 12 miles south-eastward of Ellis Bay.

ELLIS BAY.—Ellis Bay affords the only tolerably sheltered anchorage in the island. Vessels, whose draught is not too great for a depth of 3 fathoms, may safely lie there during the three finest months of summer, namely, June, July, and August; but they should moor with an open hawse to the southward. Larger vessels, whose object is to remain for a few hours only, may anchor further out, and in 3½ and 4 fathoms, but neither the ground nor the shelter will be found so good as further up the bay.

The best berth is in a line between Cape Henry and the white cliff, bearing W. S. W. ½ W., and E. N. E. ½ E. respectively from each other; Gamache House, N. by E., and Cape Eagle between S. S. E. ½ E., and S. S. E. ¼ E. The vessel will then be in 3 fathoms, over muddy bottom, distant about 300 fathoms from the flats on either side, and about half a mile from those at the head of the bay. The extremities of the reefs, off Capes Henry and Eagle, will bear S. W. by S. and S. ½ E. respectively; thus leaving 3½ points of the compass open, but in a direction from which heavy winds are of very rare occurrence. and never last long. Moreover, when they do chance to occur, the sea is much less at the anchorage than might be expected, although very heavy in the entrance between the reefs. These reefs are of flat limestone, and dry at low water; and as the tides only rise from 4 to 7 feet, the sea always breaks upon them when there is the least swell. The reef off Cape Henry runs out nearly a mile to the southward, and that off Cape Eagle near three-quarters of a mile to the westward. The entrance between them is 600 fathoms wide, from 3 fathoms to 3 fathoms. Extensive flats project from these reefs quite round the bay, and do not entirely dry at low water, excepting in very low spring tides, but there are immense boulder stones upon them which always show. These flats occasion the landing to be very bad, excepting at high water, which is the only time that supplies of good water can be obtained from Gamache River.

Ellis Bay can be easily made out from sea, for Cape Henry is a bluff point, and the land being very low at the head of the bay, occasions the opening to show distinctly. On a nearer approach, Cape Eagle and White Cliff on the east side, and the houses near the head of the bay, will be easily recognized with the assistance of our chart; whilst two ridges, or hills, will be seen far back in the country, and to the northward and eastward.

The long line of breakers on either side, and the numerous large stones so far from the shore ahead, will present any thing but an agreeable appearance to those who may approach this bay for the first time, but there will be no danger, if the following direction be attended to. In approaching the bay from the westward, with westerly winds, run down along the outside of the reefs off Cape Henry by the lead, and in 10 fathoms, until the following leading marks come on: namely, the west side of White Cliff on with the east side of the westernmost of two hills, far back in the country, and bearing N. E. ¾ N.; then haul up with these marks on, and they will lead you into smooth water, close under Cape Henry Reef, in 3½ fathoms. Continue running in, with these marks on, until Gamache House bears N. by E.; then haul up for it, and anchor in the berth which I have previously recommended. The lead should be kept going, and the reefs on either side should not be approached nearer than 3 fathoms, in any part, until you arrive at the anchorage.

In running for the bay from the south-eastward, with an easterly wind, come no nearer to the west point of Cape Eagle Reef than 7 fathoms, until the east side of White Cliff come on with the east side of the same hill as before, then haul up with this mark on till the houses bear N. E., and proceed as above directed. Take notice that the west side of White Cliff is used for the leading mark in westerly winds, and the east side in easterly winds, the intention being to keep the vessel in either case from going too near the lee side of the channel.

On the outside of Cape Henry, and continuing to the west point of Anticosti, reefs extend 1¼ mile from the shore; and vessels approaching it should keep the lead going, and attend to the soundings in the chart.

WEST POINT is low and wooded, with reefs which do not extend beyond a mile from the shore, and vessels may pass it in 15 fathoms at the distance of 1¾ mile.

The north coast of Anticosti, between the west and north points, is low, with reefs of flat limestone, extending one mile from the shore. There are soundings, in moderate depths, for more than one mile out from the reefs. Vessels should not go nearer than 25 fathoms. In the rear of the coast, and about half way between the west and north points, are the two hills, or ridges, mentioned as forming one of the leading marks for Ellis Bay. From North Point to High Cliff, a distance of 13 miles, the coast is rather more bold and elevated, parallel ridges, in an east and west direction, and with small streams between them, beginning to abut upon the coast. North Point is wooded, of very moderate height, and without any cliff. It is so little remarkable as to be only distinguished by the change which takes place at it in the direction of the coast. High Cliff Cape is easily recognized, being the only cliff on the island that has a *talus* in front of it, or that has not its base washed by the sea at high water.

From High Cliff to White North Cliff, a distance of 26 miles, the coast is low in front, with ridges of considerable elevation a few miles back in the country. This is the most dangerous part of the north coast, for the reefs extend nearly 2 miles out from high water mark, beginning at some low cliffs 7 miles eastward of High Cliff Cape, and continue to do so for 4 or 5 miles to the south-eastward, after which they gradually diminish in breadth, till at White North Cliff they are not more than half a mile from the shore. There is, however, less warning by the deepsea lead all along this part of the coast until we approach White North Cliff, off which there are 70 fathoms, at the distance of 1½ mile from the surf.

White North Cliff is very remarkable, for there is no other high cliff near it. It appears like a white patch on the land, and can be seen from a distance of 6 or 7 leagues.

Low cliffs commence 4 miles south-eastward of White North Cliff, and continue to Carleton Point, under which vessels may anchor in fine weather and westerly winds, and obtain wood and water. Ten miles further to the south-eastward is Cape Observation, a bold, high, and remarkable headland. On its west side there is a magnificent range of greyish white cliffs, several hundred feet high. At the extremity of the cape, these cliffs become suddenly much lower, and then rise again to their former elevation for a short distance on the east side. As this is well described in the chart, the cape will be easily recognized. Vessels may anchor under it with westerly winds and fine weather, and obtain supplies of wood and water very conveniently. Twelve and a half miles further south-eastward, along a bold coast with high greyish white cliffs, and small bays between, brings us to Bear Head, also of greyish white cliffs, 400 feet high, and resembling in some degree Cape Observation. This last named cliff has no equally high cliffs to the westward of it, whilst Bear Head has a difference which will prevent the one from being mistaken for the other.

From the West Cliff to Bear Head the coast is extremely bold, there being in most parts 100 fathoms of water within 3 miles of the shore.

BEAR BAY is situated between Bear Head and Cape Robert, which are distant nearly 6 miles from each other, in a N. N. W. ¼ W. and S. S. E. ¼ E. direction nearly. It is by far the best roadstead on the north coast of Anticosti, and, indeed, the only one in which a large ship would like to anchor, unless she had some particular object in view. It is sufficiently roomy, the bottom is excellent for holding, the depth of water moderate, and the shelter extends from N. N. W. round by W. and S. to S. E. by S. In order to recognize this anchorage, it may be observed that Cape Robert consists of cliffs of the same color and elevation as those of Bear Head; and that there are two other points of cliffs 300 feet high within the bay, the south-easternmost of which is named Tower Point. Between Tower Point and Cape Robert, at a distance of one mile from the former, as well as from the western shore, and in 13 fathoms of water, over a bottom of brown mud, is the best anchorage, where Tower Point will bear N. W. ½ W., Cape Robert S. E. ½ S., and Bear Head N. by W. ¼ W.

Bear Bay is divided into three smaller bays by the two high points of cliff which I have mentioned. In each of these bays there are fine bold beaches of sand and limestone shingle, and streams where water may be easily obtained. But the principal stream is Bear River, which enters the southernmost of the three bays close to the S. E. side of Tower Point. It is too shallow and rapid to admit boats, but the water is clear and good. The cliffs in Bear Bay are magnificent: they are of greyish white limestone, in thin strata dipping very slightly to the southward, and are perpendicular or overhanging. At the extremities of the points the cliffs are rounded by the action of the waves and atmosphere so as to resemble towers, which resemblance is rendered stronger by the masonry-like appearance of the rock. The trees are of diminutive growth.

From Cape Robert to Table Head, a distance of 19 miles to the south-eastward, the coast is broken into small bays, with shingle beach and small streams between high headlands, terminating in perpendicular cliffs, the bases of which are washed by the sea. None of these bays afford good anchorage. Table Head is rendered remarkable by the

hill from whence it derives its name, and which rises immediately from the summit of the cliffs.

FOX POINT is 4 miles further to the south-eastward, and much lower than Table Head. Fox Bay, which is a little less than 2 miles to the southward of Fox Point, is about 1 mile wide and deep, with sandy beach at its head, where there is a considerable stream issuing from a small lake. Boats may enter the outlet of this lake at high water. The house and store of M. Godin are on the N. W. side of the head of the bay, and are the scenes of the dreadful sufferings and melancholy fate of the crew and passengers of the ship Granicus, wrecked on this coast in November, 1828, and who all perished from want of food, after enduring the most horrible misery, before the following spring.

REEF POINT, of very low limestone, is the southern point of Fox Bay, from which a reef of flat limestone, covered with only a few feet of water, runs out to the distance of fully 1½ mile. There is a depth of 10 fathoms close off the end of this reef, so that it is extremely dangerous. To be sure of clearing it to the north-eastward, a vessel should not be brought nearer by the lead than 17 or 18 fathoms; or if any of the land to the north-westward of Table Head be open clear of it, she will pass in safety.

NORTH REEF.—From the northern point of Fox Bay, which is a cliff of moderate height, another reef runs out more than a half a mile to the south-eastward. A point of the southern reef, before mentioned, extends to the northward in such a way as to overlap the reef off the northern point, leaving an entrance from the north-eastward between the two only a quarter of a mile wide, and 13 feet deep at low water. Inside there is a space half a mile wide, from 2 fathoms to 2 fathoms, and with 16 feet in the middle, over muddy bottom. A wind from E. by N., or E. N. E., blows right into the bay; but I am told that the sea does not roll in, but in heavy weather breaks on the reefs and in the entrance. This account I believe to be correct, and that small vessels would be perfectly safe there during the summer months.

Between Fox Bay and East Cape, the coast is of limestone cliffs, 100 feet in height, bold and free from danger. Between Cape Sand-top and East Cape vessels may anchor with all westerly winds in from 16 to 20 fathoms, over fine sand, at a distance of one mile from the shore.

The tides and currents around Anticosti are so irregular that I can add very little to that which has been already stated.

I have seen the stream run along the land for a whole day at the rate of a mile per hour, in either direction, without any apparent cause, and altogether regardless of the change of tide. At other times I have found the tides regular in shore. Under these circumstances it is evident that the set of the stream, at any time or place, cannot be reckoned upon with certainty.

However, in addition to my previous remarks, I may observe that there is usually very little stream in any direction on the north coast, from White Cliff south-eastward to Table Head. From the latter to East Cape, on the contrary, there is very frequently a stream from the northward, running at a rate varying from a half to one knot. In one or two instances I have seen this stream commence and end with the flood tide, so that I have been led to imagine a connection between them; and, if this be the case, it may arise from the circumstance of its being high water sooner on the north coast, up as high as the Esquimaux Islands, than at the east point of Anticosti. The waters having thus attained a higher level to the northward may, in consequence, flow to the southward. On the other hand it must be mentioned that I have observed this stream during the ebb tide.

It frequently happens that, when this currrent from the northward is running, another from the W. N. W. comes along the south coast, in which case they meet at the reef off Heath Point, and cause a great ripple, or irregular breaking sea. When this has been observed by us, there has been usually a fresh breeze along the land on either side of the island; the wind on the north side of the island being from the N., or N. by E., whilst that along the south side was W. N. W. I have seen both these winds blowing a smart double-reefed topsail breeze at the same time, and for a whole day together, and yet never meet round the east end of the island, which is nowhere more than 200 feet in height. Between the two winds there was a triangular space of calm and light baffling airs: the base of this triangle extended from Heath Point to East Cape, and its apex from 5 to 8 miles to the eastward of the island. I mention this circumstance because it would be dangerous for a vessel to stand into the calm space between the two winds, where the high cross sea and constantly changing light airs might leave her at the mercy of the current, in no small danger of being set on the Heath Point Reef.

I have been for hours endeavoring to get out of this singular space, trimming sails to light airs, which did not remain steady to any one point for a minute of time; and I was finally, in spite of every effort to the contrary, carried over the reef by the current, seeing the rocks distinctly under the vessel's bottom, but fortunately drawing too little water to strike upon them.

THE SOUTH COAST OF THE GULF AND RIVER ST. LAWRENCE, FROM CAPE DESPAIR TO THE RIVER MAGDALEN.

CAPE DESPAIR, the N. E. point of the bay of Chaleur, consists of red sandstone cliffs, without beach, and of a moderate height above the sea.

LEANDER SHOAL bears from Cape Despair S. S. E., distant rather more than 1½ mile. It is about a quarter of a mile in diameter, from 4 fathoms to 4 fathoms, and has 16 feet least water on one spot, which, however, it is very difficult to find. It is a rocky shoal, and there is a clear passage between it and the cape. The leading marks are as follow: the line of the White Head, in one with the inner or N. W. end of Percé Rock, passes just outside of the shoal, in 7 fathoms; therefore the whole of Percé Rock, well open to the eastward of the White Head, will lead clear outside of all. From a half to the whole of the Percé Rock, shut in behind the White Head, will lead clear between the Leander and Cape Despair.

BONAVENTURE ISLAND has bold and perpendicular cliffs of red sandstone and conglomerate on all sides excepting the west. These cliffs, in some parts, attain an elevation of 250 feet above the sea, and their ledges and fissures are the habitation of innumerable gannets. From the west side, shoal water extends to the distance of a quarter of a mile, and there is anchorage in 15 fathoms between it and White Head; but the riding is insecure and heavy in consequence of the swell, which, in bad weather, rolls round the island. The channel between Bonaventure Island and the Percé Rock is about 1½ mile wide, and free from danger.

THE PERCE ROCK is 288 feet high, precipitous all round, and bold to seaward. It is narrow, and about one-third of a mile long in a S. E. direction, being an outlier to the range of cliffs on the S. W. side of Mal Bay. It is rendered remarkable by two large holes which have been perforated through it by the waves, and through one of which a boat can pass at high water. Between this rock and the White Head is the Bay of Percé, having a reef at the distance of half a mile to the S. W. of the Percé Rock, and extending out nearly half a mile from the shore, as will be seen in the chart. Small vessels engaged in the fisheries anchor on either side of this reef with winds off the land, but it is a dangerous place, and not to be recommended for large vessels.

The town of Percé, principally inhabited by persons engaged in the fisheries, occupies the shores of the bay, and Mont Percé, or, as it is sometimes called, the Table Roulante, rises, immediately from it, to the height of 1230 feet above the sea. This mountain is very remarkable, and can be seen at sea from a distance of 40 miles. A reef connects the Percé Rock with Point Percé, and off the N. E. side of the latter small vessels anchor with westerly winds. There is generally a regular tide of flood and ebb, of about a knot, between Bonaventure Island and the main land: the flood tide running to the S. W. round Cape Despair and up the Bay of Chaleur; and the ebb in the contrary direction. Two or three miles outside, or to the eastward of Bonaventure Island, the current to the southward out of the St. Lawrence, will often be found running regardless of the tides.

MAL BAY is between 5 and 6 miles wide, by 4 miles deep, and entirely open to the S. E. On its S. W. side, and under the Percé mountains, there are magnificent cliffs 666 feet in perpendicular height above the sea. Its N. E. side has low cliffs of sandstone, with occasional beaches. A fine broad sandy beach extends right across the head of the bay, and incloses a shallow lagoon. A considerable river, and several small streams, discharge their waters into the lagoon, which has an outlet in the N. W. corner of the bay, called the Tickle, admitting boats at high water and in fine weather. There is anchorage all round the shores of Mal Bay, but as a heavy sea and thick fog often precede a S. E. gale, and render it difficult for a vessel to beat out, it cannot be recommended. There is an open cove or small bay on the N. E. side, in which a vessel can be occasionally moored close to the shore, and in 3 fathoms water, but this is of no use for the general purposes of navigation.

POINT PETER is the N. E. point of Mal Bay, and the south point of Gaspé Bay; it is of low sandstone, and thickly covered with the white houses of the fishermen. Flat Island lies about 400 fathoms off Point Peter; and is small, low, and of sandstone. There is a clear channel between the island and the point, but no good anchorage; for although vessels occasionally anchor to the northward of the island, yet the ground is so foul, that there is great danger of losing an anchor from its hooking the rocks.

From Flat Island to Cape Gaspé, across the mouth of Gaspé Bay, the course is N. N. E., 7¼ miles.

GASPE BAY.—The admirable bay of Gaspé possesses advantages which may hereafter render it one of the most important places, in a maritime point of view, in these seas. It contains an excellent outer roadstead off Douglas Town; a harbor at its head, capable of holding a numerous fleet in perfect safety; and a basin where the largest ships might be hove down and refitted.

The course up this bay from Flat Island to the end of Sandy-beach Point, which forms the harbor, is N. by W. ½ W. rather more than 16 miles. From the Flower-pot Rock to the same point, the course is N. W. ½ N. and distance nearly 11½ miles,

From Point Peter the land rises in undulations to the chain of mountains about 5 miles inland from the south-western shore of the bay. These mountains, in some points, attain an elevation of 1500 feet above the level of the sea, and sweeping round Mal Bay, terminate with the Percé Mountains, before mentioned. The south-western shore of Gaspé Bay, from Point Peter to Douglas Town, a distance of 12 miles, presents a succession of precipitous headlands; the cliffs, of bituminous shale and sandstones, being in their highest parts, 200 feet above the sea. Shoal water extends nearly a third of a mile from the cliffs, and vessels beating should beware of this, since the water shoals too rapidly to allow of much warning by the lead,

CAPE GASPE.—Cape Gaspé is an extremely remarkable headland, of limestone, having on its N. E. side a magnificent range of cliffs, which rise from the sea to the height of 692 feet. Flower-pot Rock lies close off the S. E. extremity of the cape, and is also a very remarkable object; the base of it being worn so small by the waves, that it appears astonishing that it can resist their force, or the pressure of the ice. It is sometimes called the "Ship's Head," at others the "Old Woman," by the fishermen, and is so bold that vessels may haul round it into the bay within the distance of a quarter of a mile. Boats may pass between it and the cape when there is no surf. The limestone of Cape Gaspé dips to the S. W., so that the cliffs within the bay are very much lower than those on the outside of the cape previously mentioned.

The N. E. side of the bay is thickly covered with the houses of the fishermen for a distance of 5 miles within Cape Gaspé; the principal fishing establishments belonging, as at Percé, to Jersey merchants. There is an anchorage with good holding ground, but in not less than 17 fathoms, except within a quarter of a mile of the shore, abreast of St. George Cove, Grande Grêve, and Little Gaspé. The word Cove is, however, inappropriately applied to any part of the shore between Grande Grêve and the cape, for though there are fishing establishments there, there are no coves whatever. This side is bold, and free from danger in every part, with the exception of the Seal Rocks, which are the only detached danger in the bay.

SEAL ROCKS.—The Seal Rocks are 6¾ miles within Cape Gaspé, one mile S. E. by S. from Cape Brulé, and half a mile off-shore. The length of this reef from 3 fathoms to 3 fathoms, and in a direction parallel to the shore, is half a mile; and its breadth a quarter of a mile. The least water is 4 feet, and there are 3½ fathoms between it and the shore. When on the outer edge of the Seal Rocks, Cape Brulé is in one with the next cliffy point up the bay, bearing N. 35 W., by compass; and this only mark is sufficient for the safety of vessels beating, for the rocks are out of the way with fair winds.

At Grand Grêve, 3½ miles within Cape Gaspé, the ridge of land dips and narrows, so that there is a portage across it, leading to the settlements at Cape Rozier. On the N. W. side of the portage a range of mountains commences, and they continue along the N. E. side of the bay, and the N. W. arm, till they are lost to view in the interior of the country. Opposite to the basin of Gaspé, they rise to the height of 1500 feet above the sea.

DOUGLAS TOWN.—Douglas Town is a village of fishermen and farmers, standing on the rising ground at the south side of the entrance of the River St. John: its position in relation to Point Peter has been already mentioned. The water is very deep in the outer parts of the bay, being from 30 to upwards of 60 fathoms, over mud bottom; but on approaching Douglas the depth decreases regularly to the anchorage.

GASPE BAY.—The roadstead off the town of Douglas is extensive, vessels may anchor in any part of it, and in any depth, from 11 to 6 fathoms, over sand and clay bottom; but the best berth is in 7 fathoms, with the entrance of the River St. John bearing N. W. by W. 1¼ mile. The course and distance from Cape Gaspé to this anchorage is N. W. by W. 7¾ miles. There is, however, no shelter from winds between S. E. by E. and S. S. E. which blow directly into the bay, and roll in a heavy swell. The riding is, nevertheless, much less heavy on such occasions than might be expected; and as the ground is excellent for holding, a vessel may safely anchor here during the summer months.

Water may be obtained by ascending the River St. John to the islands, a distance of 2 miles. In the spring of the year there is often 9 feet water in the entrance of this river, which is between 2 points of sand, as will be seen in the chart: and there are 12 feet of water in the narrow channel for some distance within. At the islands the river becomes shallow and rapid.

CAPE HALDIMAND.—Cape Haldimand, 2 miles northward of Douglas, is a bluff point of cliff, and the south-eastern termination of the range of hills which separates the harbor, basin, and S. W. arm, from the valley of the River St. John.

GASPE HARBOR.—From the N. E. side of Cape Haldimand, Sandy-beach Point runs out to the northward, and forms the Harbor of Gaspé. It is a very low and narrow point of sand, convex to seaward, on which side the water deepens gradually from high water mark to the depth of 3 fathoms, a distance of nearly half a mile: on the inside it is as bold as a wall. Thus this spit, apparently so fragile, becomes a natural dam or breakwater, upon which the heavy swell, which often rolls into the bay, can produce no effect, expending its strength in the shoal water, before reaching the beach. The water deepens

immediately outside of 3 fathoms, all along the outside of Sandy-beach Point, and also off its north extremity; so that it is both dangerous and difficult to beat in or out of the harbor at night; the lead giving little or no warning.

To the northward of Sandy-beach Point, at the distance of nearly a mile, is the peninsula, which is a low sand, covered with spruce trees, and it has several whale sheds near its west point. Between the shoal water in the bay to the eastward of the peninsula, and that which extends from the extremity of Sandy-beach Point, is the narrowest part of the entrance to the harbor, which is 420 fathoms wide, from 3 fathoms to 3 fathoms, and upwards of 11 fathoms deep in the centre.

To run into the Harbor of Gaspé attend to the following directions and remarks. On the N. E. side of the N. W. arm, there is a wooded point with low clay cliff, 2¾ miles above the peninsula. This point appears as if it were the extreme on that side, when seen over the end of the peninsula from a vessel approaching the entrance of the harbor, and is called Point Panard. Now this point (seen over the peninsula,) in one with the inner or north side of the whale sheds before mentioned, is the mark for the northern extreme of the shoal off Sandy-beach Point. The extremity of the spruce trees is as far within the whale sheds as these last are from the sandy extremity of the peninsula. On the inner side of Sandy-beach Point, and near to its junction with the main land, stands a wooden windmill. Keep Point Panard in one with that extremity of the spruce trees on the peninsula, bearing N. 47 W., until the windmill, just mentioned, comes in one with the west or inner side of the end of Sandy-beach Point, bearing S. ½ W., when you may haul into the anchorage under the point, or steer for the basin, as may be desired.

When beating in, tack by the lead from the N. E. side of the bay, and in the board towards Sandy-beach Point, put the helm down the instant the marks for leading in, just given, come in one.

At night, when neither Sandy-beach Point, nor the peninsula can be seen, it becomes rather a difficult affair to tack a vessel into the harbor. The only guide then is the lead. There should be a hand in each chains, one heaving when the other cries the soundings. Soundings should be first struck on the N. E. side of the bay, about 2 miles outside of the entrance of the harbor, and the edge of the shoal water on that side should be followed, in from 5 to 7 fathoms, until you judge, by the distance run, and the change which takes place in the direction of the edge of the bank which you are running upon, that you are approaching the peninsula and have passed Sandy-beach Point, and can, in consequence, venture to haul to the southward into the anchorage. To form this judgment accurately is the difficult part of the process, and as to fail in this would probably cause the loss of the vessel, if the usual heavy swell should be rolling into the bay with S. E. winds, I recommend a vessel rather to trust to her anchors off Douglas Town than to make the attempt. In case of a vessel which has lost her anchors, the directions which I have given may prove of use. Within Sandy-beach Point, that is in the Harbor of Gaspé, the shelter is complete from all winds; the bottom is mud, and the depth nowhere exceeds 11½ fathoms.

Having now given directions to enable the seaman to take his vessel into a place of perfect security, from which he may proceed to the basin, or to any other part of the harbor, with the assistance of the chart, or of a pilot, I shall not swell these remarks by a minute description of the interior of the harbor, which the chart renders unnecessary, and which is not in any way essential to safety.

I shall merely add that the harbor is divided into the N. W. and S. W. arms. The N. W. arm has deep water for nearly 3 miles above the peninsula, and continues navigable for keeled boats about 3 miles further, where the principal river of the harbor enters the arm between Marsh and Meadow Islands.

The entrance of the S. W. arm is about 180 fathoms wide, and between two sandy points, but the navigable channel is contracted by shoals on either side to about 60 fathoms: and 5 fathoms of water can be carried in. The deep water part of the S. W. arm, which continues for three-quarters of a mile within the entrance, is called the Basin of Gaspé; it has a depth of from 5 to 9 fathoms, over a mud bottom, and is sufficiently capacious to hold a very great number of vessels as securely as in a dock. Boats can ascend this arm by a narrow channel, between shoals, about 3 miles, as in the N. W. arm, and the navigation, for all but canoes or flat-bottomed boats, is terminated in the same manner, by shallow channels between Marsh and Meadow Islands; above this part of the river it becomes contracted and rapid, and the water fresh. A small rivulet in the bay, on the inside of the south point of the entrance of the basin, is the most convenient watering place in the harbor. The Collector of Customs, and the principal families, reside on the shores of the basin. Most of these families, as well as those of the N. W. arm and the harbor generally, are farmers, but several of them are also engaged in the whale fishery, which they prosecute in small schooners. The cod fishery is carried on by the people of the bay outside, for the most part in connection with the Jersey merchants. The great majority of the fishermen are either from Jersey, or descended from the people of that island, whose language they retain.

There are regular but weak streams of flood and ebb in the entrances of the harbor and

basin. In the bay the streams of the tides are so irregular, that I can say nothing certain respecting them. They are, however, usually almost imperceptible, excepting near the shores, and even there they are so weak as to be of little or no consequence to a vessel.

The current down the St. Lawrence runs strongly past Flower-pot Rock over towards Flat Island, especially in the ebb tide, which often increases its rate to 2 knots, and this should be remembered by vessels making the bay with a northerly wind. This current, when it meets the swell which so often prevails from the S. and S. E., causes a high, short, and breaking sea, all along the coast from above Cape Rozier to Cape Gaspé, and extending across the entrance of Gaspé Bay. When the wind is light, a vessel becomes quite unmanageable in this sea, and it is extremely dangerous to be caught in it, close to the shore, by a light breeze on the land.

In fine summer weather there is often a sea-breeze blowing right up the bay from about 9 A. M. until sunset. At such times, there is generally a light land-breeze at night down the arms, which often extends for several miles out into the bay. In the outer part of the bay, however, it will generally be found to be calm, even at times when a fresh breeze is blowing outside Cape Gaspé and Point Peter. The wind at sea on such occasions is generally from the S. W.

The soundings off this part of the coast will be seen in our charts for the first time; they will prove of very great use to vessels running up in foggy weather, and had they been previously known, might have saved many vessels. We had an opportunity of judging of this last spring, when a large ship, full of emigrants, ran stem on to Whale Island in Gaspé Bay. She was under all sail before a moderate S. E. wind, in a thick fog, and steering N. W.: from which it appears that she must have been running in soundings from 20 to 40 fathoms, for at least 4 leagues, and, probably, for 3 hours before she struck. No lead was hove, the existence of the soundings being unknown. The vessel was conceived to be well to the northward, and, consequently, to be steering a safe course. One cast of the lead would have dispelled this delusion, and might have saved the vessel. Let this be a warning to seamen.

In the prolongation of the line of Cape Gaspé nearly, there are several rocky patches frequented by the fishermen. They all lie in the same direction from Flower-pot Rock, S. S. E. ½ E. The first is a small patch with 8 fathoms least water, the second has 16 fathoms, and the third 10 fathoms. Their distance from the rock are ⅞, 1½, and 13 miles respectively. There is deep water and irregular soundings between them, and the last mentioned is on the banks of soundings which I have already alluded to, as lying off this coast.

The bold and high coast between Cape Gaspé and Cape Chatte, a distance of 117 miles, will require only a brief notice, as it is free from dangers and destitute of harbors.

The mountains every where approach the shore, which is steep and rocky, displaying cliffs, often of great height, and without beach. After heavy rains, waterfalls, which are not to be seen at other times, descend from great heights, and small bays, with sandy beach and rapid streams at their heads, occur occasionally; yet these features are not generally so strongly marked as to enable a stranger to make out one part of this coast from another with facility.

CAPE ROZIER.—Cape Rozier, which is nearly 7 miles N. ½ E. from Cape Gaspé, is low, and of greywacke and slate rocks. The shoal water does not extend off it above one-third of a mile, but in the bay to the southward of it, at the distance of 1¾ of a mile, there is a reef which runs out half a mile from the shore. Vessels may find shelter under Cape Rozier from N. W. winds, but the ground is not very good, and the easterly swell that frequently rolls in, renders it a dangerous anchorage. There are fishing establishments on Cape Rozier, and in its vicinity.

GRIFFIN COVE.—Griffin Cove and River are 6½ miles N. N. W., nearly, from Cape Rozier. A small bay here affords shelter to the boats of the fishermen, whose houses will be seen around it. There are from 2 to 3 fathoms of water in this bay, over sandy bottom. It is of no use to shipping, except to obtain supplies of water, wood, and, occasionally, fresh provisions.

GREAT FOX RIVER.—Great Fox River is 11½ miles N. N. W., nearly, from Cape Rozier. It is a mere brook which enters a small bay about three-quarters of a mile wide, and half a mile deep. Off each point of the bay there are reefs, which diminish the breadth of the entrance to less than a quarter of a mile, and afford shelter to boats, and to very small schooners, in from 2 to 2½ fathoms, over a bottom of fine dark sand. Round the head of the bay there is a fine sandy beach. Outside the reefs, which extend only a very short distance to seaward, there are 15, 18, and 24 fathoms, over a bottom of sand and broken shells, at the distance of a quarter, half, and 1 mile respectively. In fine summer weather a vessel might anchor off this place and obtain water, wood, and supplies of fresh provisions; but it is otherwise of no use to shipping. Seven families of fishermen and farmers resided here when I visited it in 1829, and had plenty of cattle, sheep, and swine.

GREAT POND.—Great Pond is a small creek which affords shelter only to boats, and will be known by the houses and stages of the fishermen. It is 16 miles N. W. ½ N.

from Great Fox River, and there are no more houses, along the coast, till we arrive at the River St. Ann.

MAGDALEN RIVER.—The next place worthy of notice is the Magdalen River, which is 24 miles from Great Pond, in a N. W. ½ W. direction, nearly. The mouth of this river is on the N. W. side of a sandy bay, and close under Cape Magdalen its N. W. point, which is rocky, with cliffs of moderate height, and juts out a very short distance from the range of hills which forms the coast line. A reef of rocks, which dry in part at low water, extends from Cape Magdalen, about 200 fathoms to the S. E., parallel to the coast, and shelters the entrance of the river from the northerly winds. The river is 30 yards wide at the entrance, and 7 feet deep at low water; within, for a very short distance, there are 10 feet over a clean bottom of fine sand. Further up, the river becomes shallow and rapid, winding its way through a romantic valley between the mountains. Thirteen feet of water can be carried into this river at spring tides, so that it is a considerable stream, and is occasionally visited by schooners from 30 to 80 tons, which warp in when the sea is smooth and the weather fine. The bay is not deep, being merely a gentle curve with a sandy beach for about a mile to the S. E. of the river. Vessels may anchor here in 7 fathoms, over a bottom of sand, fine gravel, and broken shells, at the distance of three-quarters of a mile from the sandy-beach, and from the N. W. point bearing W. N. W. The shelter is from W. N. W., round by S. W., and S. to E. S. E., but it is only a fine weather anchorage, which may be of use to vessels wanting wood and water.

During two occasions, on which I anchored here, I observed a regular alternation of the stream of flood and ebb. The flood extended about 1½ mile from the shore, running 1 knot, and at the line of junction with the almost constant downward current there was a strong ripple.

We extract the annexed manly testimonial to the merits of Captain Bayfield's predecessor in his arduous undertaking, from Captain Bayfield's book: (E. & G. W. B.)

"Our survey, from the Strait of Belle Isle westward, ended at Mistanoque inclusive, and recommenced again at Grand Mecatina. The intermediate coast was surveyed in 1768 by Mr. Michael Lane, R. N. We examined it with his original chart in hand, and although his survey does not possess the exactness which superior instruments and an improved system of hydrography gives to modern maritime surveys, yet it is such as to confer honor on his memory, being quite sufficiently correct for the usual purposes of navigation."

We here conclude the extracts from Capt. Bayfield's work.

CHALEUR BAY, TO THE GUT OF CANSO.

CHALEUR BAY.—Point Macquereau and Miscou Island form the entrance of Chaleur Bay, and bear from each other S. ¾ E., and N. ¾ W., distant 4½ leagues. From the entrance of Chaleur Bay to that of Ristigouche Harbor, which is at its head, the distance, on a W. and N. W. by W. course, is 22 leagues. The bay is of moderate depth near the shore on both sides, and has, towards the middle, from 45 to 20 fathoms water.

Nouvelle Harbor lies about 14 miles W. by S. from Point Macquereau, where are a church and several houses.

NEW CARLISLE.—The town of New Carlisle, the principal town of Chaleur Bay, is situate in Coxe township, on the north shore, as shown in the chart.

BONAVENTURE.—In the adjoining township of Hamilton, on the west, is the village of Bonaventure, containing a church and several houses, standing on level ground.

From Bonaventure the land turns N. W. by N. towards Cascapedia Bay, along an iron bound shore, and having several rivulets of fresh water; within this bay is anchorage in 4, 5, and 6 fathoms water; this is in the township of Maria; the head of the bay is shoal, into which the Great Cascapedia River empties itself.

In RISTIGOUCHE HARBOR, at the head of Chaleur Bay, there is good anchorage in from 8 to 12 fathoms, land-locked from all winds; but it is so difficult of access, that it should not be attempted without a pilot. The tide flows here, on full and change, until 3 o'clock, and its vertical rise is 6½ or 7 feet.

NIPISIGHIT.—Vessels bound into Chaleur Bay should make for the Island of Miscou, which they can round by the lead, for it shoalens gradually from 20 to 3 fathoms, the latter depth being near Miscou Point; should it be foggy, which in summer time is frequently the case, it will be advisable to steer from thence towards the northern shore, when you will most probably fall in with Nouvelle Harbor; here stands a church, upon some rising ground to the northward of the town or village, which is built along the beach and lies low. Proceeding up the Bay of Chaleur from hence, you will pass round a low point and reach Carlisle; this is somewhat similar to Nouvelle, for the town stands on a low point and has a church above it; both are near the beach. Having got abreast of Carlisle, if you are bound across for Nipisighit Roads or St. Peter's, then, by keeping on the northern shore as thus directed, you will readily know how far you have pro-

ceeded up the bay, and may then haul across, with greater certainty, for the land, between Caraquet Point and Cape Idas, which you may approach to by your lead without the least danger; the land on the northern shores of Chaleur Bay is in a high state of cultivation, when compared with the southern shores; and this, perhaps, is the principal cause why the fogs that obscure it are less heavy on the former than on the latter. From Cape Idas to Nipisighit Roads, the shore is clear of all danger, and when the weather is dark or foggy, you may safely run along the land by your lead, only observing to come no nearer than 5 fathoms water, for in that depth you will be only 3 miles off the land. From abreast of Cape Idas, steer W. by S. about 9 miles; you will have from 5 to 7 fathoms all the way, clear of all danger, and get good anchorage: in opening the bay, you will see Mr. Miller's house and store standing on Carron Point, on the larboard hand, and appearing like an island; there is a large grove of trees to the southward of the house, and the open space between that and Mr. Sutherland's gives it that appearance: steer for the house and store on Carron Point until you get about 4 miles distant from it, then bring Mr. Miller's house on Carron Point to bear S. W., and anchor in from 7 to 5 fathoms, where you may heave your ballast; here a pilot will board you, but should no one come, and you are inclined to enter the river, your vessel having but a small draught of water, then the following directions by Captain Aldridge will prove acceptable, and lead you over both bars; and when you get inside of them you will find good anchorage to the northward of Carron Point, in 3 and 4 fathoms, good ground.

Bring Mr. Miller's house half a handspike's length of Indian Island; this has a round tuft of trees on it, and will lead you in mid-channel clear of all danger: when you arrive abreast of Carter's Point, you should open the upper part of Lathwood House; steer in that direction close to the beach, until you open the beach of Carron Point with Mr. Miller's house, then run a little further up, and anchor in 12 or 14 feet water, sandy ground; from Carron Point to Munro's Wharf there are three bars, with not more than 6 feet water over them, but there are places between them, with 16, 15, and 14 feet, where a number of vessels load.

The Tatigouche, or Little River, is only navigable by canoes; the middle river is deep, but bars run across the channel in many places; the banks on each side, from the village to Carron Point, dry at low water.

TIDES.—It flows full and change at 3 o'clock, and the water rises on the inner bar 8 feet, on the outer bar 5 feet, and in the harbor 8 feet, with regular springs, but it is much influenced by the winds which prevail in the Gulf of St. Lawrence; in summer time no vessel should load down to more than 13 feet, and then the bar should be attempted with the first of the springs.

From abreast of the north point of Miscou Island to the south point of Shippigan Island, the distance is 19 miles, and the course is nearly S. W. by S. From the south point of Shippigan to Tracadie, the course and distance are S. W. ½ S. 4 leagues. From Tracadie to Point Esquiminac, or Escuminac, on the south side of the entrance of Miramichi Bay, the course is S. by W. ½ W., distant 9 leagues.

MIRAMICHI BAY.—This is a spacious bay, having at its entrance several islands; the northern shore is fronted by some small sand islands, having channels between them and the main, into which boats may enter; behind these is an Indian village called Negowack, but the chief passage into the harbor is between Waltham, or Portage Island, and Fox Island: to enter this you must borrow towards the southern point of Escuminac, and pass to the southward of a long narrow shoal which stretches in front of Fox's Island, and forms the channel of 1¼ mile wide, with 4 and 5 fathoms water in it; having advanced to the northward of Fox Island you must turn westerly, and pass between the southern point of Waltham Island and the northern point of Fox Island: on your starboard hand lie 3 black buoys, which mark the edge of the Horseshoe Sand; there is also a red buoy on the larboard side of the western part of the Bay de Vin Island: through this part of the channel you will have 3½ fathoms, and having arrived abreast of the Red Buoy de Vin, you may steer W. N. W. for Oak Point, in 3, 3½, and 4 fathoms; here the greatest care must be observed, in order to take the passage between Sheldrake Island and the Sandy Spit which runs off Point Cheval; run very near the N. E. point of that island, steer south-westerly for Nappan Bay, and round the south part of Sheldrake Island, you will then see Old Custom House situated upon the northern shore; from whence, by keeping mid-channel, and following the sinuosities of the river, you will safely pass Middle Island, and have 7 and 6 fathoms without any danger, until you reach the town of Newcastle, here the water lessens to 3 fathoms; ahead you will perceive Beaubac or Frazier's Island, dividing the channel in two passages; that to the south-eastward is the better one, and runs into the S. W. branch of the river; that to the northward leads into the N. W. branch; both these have their rise a considerable distance up the country. The New Custom House stands on the southern shore, about 2 miles beyond Middle Island: there are several places of good anchorage about this harbor, but the navigation is in general so intricate that a pilot will always be necessary, and he will point out the best places for riding. Spring tides rise 5 and 6 feet, and the buoys are frequently shifted.

There is good anchorage with off-shore winds in Outer Bay, but you must not go into less than 7 fathoms water. The pilots' houses are 4 or 5 miles to the westward of Escuminac Point, and pilots for this place are sometimes obtained from the Gut of Canso. Considerable quantities of timber have recently been shipped from this harbor for Europe, but a late tremendous and extensive fire having made great devastation in the adjacent woods, destroying the dwellings and property of most of the inhabitants, and reducing them to the greatest distress, it will take some considerable time before they can recover their losses, or resume their former occupations.

From the northern part of Miscou Island to Escuminac Point, the soundings are regular; and in thick weather the shore may be approached by the lead to the depth of 12 or 10 fathoms. In passing Escuminac Point you must give it a good berth, for a sandy spit runs off it a full league.

RICHIBUCTO.—The depth of water at the entrance of this harbor is, at the best and highest tides, about 18 feet, and with common tides 16½ feet. When you are off the harbor's mouth, in 6, 7, or 8 fathoms water, you should endeavor to steer in, bringing the two large beacons in a line, and keeping them so, until you get up near to the Sand Hill; then run along the shore about N. W., in 3 or 2½ fathoms, until you find yourself in safety. There is a large buoy, laid down in 5 fathoms, outside of the bar, which is a good guidance in, and may be seen as you approach, for upwards of a league off.

Within Cape Tormentin is the isthmus and boundary between New Brunswick and Nova Scotia, the narrowest part of which, from the Bay Verte to Cumberland Basin, at the head of Chignecto Bay, is only 15 miles in breadth.

THE NORTHERN COASTS OF NOVA SCOTIA, &c.—The general features of the northern coast of Nova Scotia are pleasing; the land low and even, or slightly broken by agreeable inequalities. The few harbors are of a very limited capacity; the soil of the country is fertile, and the woods abound with beach, oak, elm, birch, maple, ash, pine, spruce, larch, juniper, hemlock, and fir. In the Strait of Northumberland, to an extent, from end to end, of not less than 100 miles, the bottom, in many places, is nearly level, and varies in its depth only from 20 to 10 fathoms, being generally a stiff clay, and the ground holding well.

Between Cocagne, on the west, and the high rock, called the Barn, on the east, the shore is in general bound with red cliffs, and beaches under them, and the island which lies between Tatmagouche and the basin of Cobequid, appears remarkably high to vessels in the offing.

Having rounded Cape Tormentin, either inside or outside of the 6 feet ledge which lies off it, you will open to the westward of the Bay Verte.

THE BAY VERTE is wide at its entrance, and narrows as you advance; the shores are lined with flats, on which the water becomes shallow, but mid-channel the anchorages are good; here vessels of considerable burthen may take in their cargoes of timber, &c. On the northern side of the bay, and near its head, is the small River of Gaspereau, on the southern shore of which stands the Fort Monckton, and on the southern part of the bay is another small rivulet called the River Tidnish; they are both too shallow for shipping to enter. The Bay of Verte is now rising into considerable importance, in consequence of its proximity to the Bay of Fundy; and the interior, from the bay to Amherst, Cumberland, La Plance, and Tantamaree, is in a highly improving state and increasing population.

RIVER PHILIP.—To the southward of Cape Tormentin, at the distance of 4½ leagues, is the entrance to the River Philip, a bar harbor, having only 10 feet at the entrance. In advancing towards this place, when in the depth of 5 fathoms, another harbor will be seen on the eastern or larboard side, which is called Pogwash. In the latter, ships drawing 17 feet load with timber. This harbor is safe; but the entrance is so narrow as to require a pilot. Ships commonly anchor outside in 5 fathoms, at 3 miles distance from shore, with the entrance bearing to the S. E.

E. N. E. ½ E. about 8 miles from the entrance to the Bay of Pogwash is the Cliff Cape, and from Cape Tormentin to Cliff Cape the bearing and distance are S. by E. ¾ E. 16 miles; from Cliff Cape to Shoal Point S. E. 3 miles: and from Shoal Point to Cape John S. E. by E. 11 miles. Between the two latter lie the harbors of Ramsheg and Tatmagouche, which are good and well sheltered, but each require a pilot.

RAMSHEG HARBOR.—Off the northern or Shoal Point is Fox Island, the flats from which extend so far from shore, at the entrance of the harbor, as to leave but a narrow channel, through which, at all times, excepting at slack water, the tide runs with great velocity, and renders the navigation into it very unsafe, although the depth up to the anchorage is sufficient for a frigate; there being, in mid-channel, 3½ fathoms at low water. In sailing in, steer south-westerly, towards Gravois Cliff, giving Shoal Point a berth of a mile, until the N. W. arm is well open; then steer for the latter, keeping your lead going, until the beach to the N. W. of Gravois Cliff bears S. W. by W.

TATMAGOUCHE is 6½ miles to the westward of Fox Island, and the channel on the western side of Amet Isle is quite clear; but, in sailing in from the eastward, between

Cape John and the isle, you should keep nearest to the cape, for a ledge extends from the isle to a considerable distance. Amet is a low island, without trees, and it will be most prudent to keep at least three-quarters of a mile from it every way. The best anchorage for ships is in the Harbor or River John, on the east side of the Harbor, in 4 or 5 fathoms, muddy bottom. Small vessels may run up to Tatmagouche, and anchor off the town in 10 or 12 feet at low water. Here the tide rises 5 feet, on full and change, and flows till 7 o'clock.

RIVER JOHN.—In coming from the eastward, when between Amet Island and Cape John, your course toward River John will be W. by S. In passing between the island and cape, you will have 4½ fathoms until you open the River John, on the larboard side. You will then have 7, 8, and 9 fathoms; and if bound for this river, or for Tatmagouche, may obtain a pilot, by making the usual signal. There is safe anchorage at 2 miles distance from shore.

In Ramsheg, Tatmagouche, and John Harbors, ships of fifteen feet draught commonly load with timber.

CARIBOU HARBOR.—From Cape John to Caribou Point the course and distance are E. S. E. 6 leagues. Here the water gradually shoalens to the shore, from the depth of 8 or 9 fathoms at two miles off. To strangers it may be dangerous to approach Caribou Harbor, as it has frequently been mistaken for Pictou, which lies to the south-westward, and some have run on shore before the error has been discovered. For it is to be observed that ships are seen riding, not in the entrance of the harbor, but within a sand bank, which stretches from side to side, having not more than 3 or 4 feet over it, and which appears like a good channel. Small vessels load with timber here. The promontory of Caribou may be known from Pictou by observing that the hollow land over it appears like a deep inlet; but the highlands of Pictou seem to fold over each other, and blind the entrance. The ledges about Caribou extend upwards of a mile from shore, and some of them are dry at low water. Nearly in mid-channel, to the northward of Caribou Point, is a rocky shoal of 10 feet. It is a quarter of a mile in circumference, and around it the depths are 4, 5, and 6 fathoms. The tides, both ebb and flood, set rapidly over it.

SUNKEN ROCK.—Between Pictou Island and Caribou Point, is a sunken rock. The rock lies in the fairway between Pictou Island and Caribou Point, being distant about one-third the breadth of the channel, in a W. by N. direction from the western point of the island. The circumference of the rock is about 400 yards, and the tide was found to set over it at the rate of 2½ miles per hour, the flood setting to the N. N. W., making high water at full and change at 9h. 30m. On its western edge, the rock has 4 and 5 fathoms close to it, and 5 to 7 fathoms on its eastern edge. The position of this rock renders it extremely dangerous to ships leaving Pictou Harbor for the westward, as it lies immediately in the fairway. The channel to the westward of the shoal is generally adopted, in which there are from 3½ to 4 fathoms, irregular soundings.

PICTOU.—The Harbor or River of Pictou has a bar across its entrance, having over it only 15 feet at low water; and without this is a shoal, called the Middle Ground, having the smaller depth of 7 feet. The entrance, on the south side of which there is a fixed light, 54 feet high, painted red and white, vertically, lies S. W. ½ S., 5 miles from the west end of Pictou Island.

In approaching Pictou from the westward, between the island and the main, the light will not be seen until it bears W. by S., and may be run for when it bears west.

In approaching from the eastward, Cape George bearing S., one mile distant, the course is W. by S.; but after making the light it ought to be brought to bear W. or W. ½ N., when the light may be run for, and will serve for a leading mark over the bar, and may be approached within two and a half cables' length, where there is good anchorage, or haul up W. N. W. until abreast of the light, or until it bears W. S. W., when the course up the harbor is west.

The windmill near the town, in a line with the beach that forms the left or south side of the entrance, is the mark to clear the Middle Ground, and for the deepest water. Within the bar and the beach the water deepens to 5, 6, and 7 fathoms, muddy bottom. This depth continues up to the town, opposite to which a mud flat extends outward so far as to leave the channel midway between the two shores. Above the town the river divides into three branches; of these, the eastern one is winding, but navigable to vessels drawing 15 feet, about 4 miles upward; at which distance the river becomes impeded by a bar, although above that the water increases. At 9 miles above the town of Pictou are the well-known coal-pits, the produce of which is brought down to the bar in large flat boats. The Middle and West Rivers are navigable upward to a considerable distance. The lands hereabout being good, the population is rapidly increasing. The town of Walmsly, on the north side of the harbor, is the residence of the principal merchants, who load timber in these parts.

MERIGOMISH, which is an excellent bar-harbor, lies 7 miles to the E. S. E. of the entrance of Pictou; the merchants of which place have ponds here, for the reception of

timber, with which a number of ships are annually laden. To sail in for this place, bring the east end of Pictou Island nearly north, and keep it so until off the harbor's mouth, where you may either obtain a pilot, or anchor in 4 fathoms. A stranger should not venture to enter the harbor without a pilot, as a ledge stretches off from either side. There is a depth of 14 feet on the bar at low water, and the vertical rise of the tide is about 8 feet. The depth within is from 4 to 7 fathoms, soft mud.

PICTOU ISLAND, which lies off the entrance of Pictou and Merigomish, is cultivated, and contains about 3000 acres. Fine quarries of freestone have been opened here, and strong traces of coal are visible in several places about the cliffs. From the east end a spit of rocks extends about half a mile; and at the E. N. E. from it, one league and a half, is a shoal of 21 feet. Between the island and Merigomish the bottom is muddy, and the depth from 11 to 7 fathoms.

There is no harbor between Merigomish and Cape St. George; but the coast is clear, high, and bold, and vessels may sail along it in safety, at the distance of a mile. As a place of refuge for small vessels in distress, there is a new pier erected on the coast, 7 leagues to the eastward of Pictou, and at the indent formed by the rock called the Barn. Cape St. George is a promontory which runs out to the N. Eastward; it is bold to, and considerably elevated, forming the western point of entrance to St. George's Bay, but there is said to be good anchorage under the cape, in from 10 to 7 fathoms; the ground is somewhat rocky, but you will ride there sheltered from westerly winds.

ST. GEORGE'S BAY, ANTIGONISH.—The entrance of the Harbor of Antigonish lies 10 miles to the S. by W. from Cape St. George. Here small vessels load with timber and gypsum, or plaster, of which there is abundance in the neighborhood; but the harbor is so shoal, that even these complete their cargoes outside of the bay, although the anchorage is not so safe.

At Pomket Harbor, 6 miles eastward from Antigonish, ships of any size may load in safety. In sailing in, when from the northward, you will leave the island on the starboard side, keeping close to a rock, which appears 5 or 6 feet above water. This rock is steep to, and lies off the east end of the island. Outside of it, at the distance of three-quarters of a mile, lie several sunken ledges, which are dangerous. After passing the rock a bay will open on the starboard side, which you must stand into, till you are shut in with the island, where there is anchorage in 3½ fathoms water, at about half a mile from the island.

ARBUSHEE, or AUBUSHEE, is an inlet which lies between Cape Jack and the Gut of Canso, forming a small harbor, occupied by an industrious and thriving people. Here a number of small vessels have been built, carrying from 15 to 50 tons. A rocky ledge extends outside the harbor, in a north-westerly direction.

THE GUT OF CANSO TO ISLE MADAME.

REMARKS.—The Gut of Canso is formed by the Island of Breton on one side, and by the land of Nova Scotia on the other. Its length is about 5 leagues, and breadth more than three-quarters of a mile. The east side is low, with beaches, but the west shore is for the most part high and rocky; Cape Porcupine being remarkably so. The deepest water is on the western shore; but both shores are bold to and sound, excepting some sunken rocks, one of which lies near a cable's length from the eastern shore, and about midway between the southern entrance of the Gut and Ship Harbor; a second is between Ship Harbor and Bear's Head, running out nearly a cable's length from shore; and a third lies off Bear's Island, about 100 fathoms from the land: the depth of water over these rocks is about 6 or 8 feet. Mill Creek, Gypsum or Plaster Cove, Venus Creek, Ship Harbor, Holland Cove or Pilot Harbor, and Eddy Cove, afford excellent anchorages, with a moderate depth, and out of the stream of the tide, which generally sets in from the southward, but is very irregular, being much influenced by the winds. After strong N. W. winds, which happen daily during the fall of the year, the water in the Gulf of St. Lawrence is rendered low, which causes the current to run northward through the Gut, at the rate of 4 or 5 knots, and the contrary happens after southerly winds.

CAPE ST. GEORGE, is a remarkable promontory, lying at the distance of 10½ leagues to the eastward of Pictou Harbor; a course of 6 leagues thence to the south-eastward, will lead to the entrance of the Gut, whence you may run along the Breton shore. It is to be observed that there is a ledge of rocks in the offing, near Arbushee, already noticed; some of these are nearly dry at low water, and nearly in the direct course for the Gut; they must, of course, be carefully avoided.

Opposite Mill Creek, at the upper end of the Gut, on the Nova Scotia side, you may stop a tide or lie wind-bound, if it does not overblow. Keep the creek open, and come to anchor in 8 or 10 fathoms, within a cable's length of the steep rocks on the south side of the creek. The best water is with the creek's mouth open. It will be necessary to carry a hawser on shore to the rocks, to steady the ship, as the tide here runs in eddies. You may obtain fresh water from the creek at low water.

Upon entering the Gut, there will be seen, on the larboard hand, a red house, on a point called Belle Ashe's Point, off which, at nearly a cable's length from shore, there is a sunken rock, which may be readily distinguished by the eddy of the tide. Within this

point, on the S.E., is Gypsum or Plaster Cove, which is known by its white appearance, and where you can anchor in soft mud, in from 4 to 10 fathoms.

SHIP HARBOR, which lies half way down the Gut, on the eastern side, is a good harbor for merchant shipping. It is, however, more particularly useful to those sailing northward, being a good outlet. It is a very proper place for ships of 16 feet draught. If bound in, from the southward, give the starboard side a berth of a cable's length, it being flat, and run in until you shut the north entrance of the Gut, and come to anchor in 4 or 5 fathoms, soft bottom; where you may wood on the Breton side, and water on the opposite shore, at Venus' Creek; the larboard side of this harbor is bolder to than the starboard side, and deepest water. Without the harbor, one third from the Breton side, you may anchor in 9, 10 to 13 fathoms, loose ground, in the strength of the tide.

Ships bound through the Gut, from the northward, may proceed through it with safety, by keeping nearly in the mid-channel, there being no danger until they arrive off the south point, called Eddy Point; but from this point extends a long spit of sand, with large round stones, which must be left on the starboard side, at the distance of half a mile from what may be seen above water. The race of the tide will serve to guide you from it. Having passed the Spit of Eddy Point, when midway, you may steer to the South, and after you have passed Cape Argos, taking care you do not open Eddy Point with Bear Island, until you bring Green Island well open with Cape Hogan, when you may shape your course for sea from the charts.

GUT OF CANSO.—When off Cape Canso and bound for the Gulf of St. Lawrence, the best passage is through the Gut of Canso, being shorter, and having the advantage of several anchoring places, out of the strength of the tide, in case of contrary winds or bad weather.

CERBERUS ROCK.—This is a dangerous rock in Chedabucto Bay, immediately in the fairway to and from the Gut of Canso; it has only 10 feet water on it, and breaks with any thing of a breeze.

The range to the eastward for this rock, is Green Island on with Point Hogan, which is the S. W. point of Isle Madame. Bound up the Gut of Canso, after getting into Chedabucto Bay, bring Eddy Point on with Bear Island, (which is a small round island off Bear Head,) and run for it until Green Island is hid behind Cape Hogan, when you may shape your course for the fairway up the gut, as you then will have passed the Cerberus.

INHABITANT BAY, &c.—Those who wish to anchor in Inhabitant Bay or Harbor, may bring the farm that is opposite to Bear Head open, the head bearing W. S. W. This mark will lead them clear, and to the southward of the Long Ledge, and in the mid-channel, between it and the steep rocks on the east or opposite shore; at the same time take your soundings from the Long Ledge, or north shore, all the way till you arrive at Flat Point; then keep in mid-channel between Flat Point and the island opposite, from the N. E. side of which runs off a spit or ledge of rocks, at the distance of a cable and a half's length; then port your helm, and run under Island Point, and come to in 5 fathoms, muddy bottom. Up the River Trent are plenty of salmon, in the season, and there you may wood and water.

N. B. The leading mark to clear the steep rocks of Steep Point is, to bring the peninsula in a line over the point of Turbalton Head, bearing S. or S. ½ E., until you open the island to the northward of Island Point: then haul up for the outer harbor, and come to in 10 or 12 fathoms, muddy bottom.

Those who are bound up the Gut of Canso, and meet a N. or N. W. wind, at the south end of the Gut, and who are desirous of good and safe anchorage in 10 to 12 fathoms water, may come to on the north side of Bear Island; but should it blow hard, to a gale of wind, down the Gut, this anchorage is not altogether so secure as a careful master or pilot would wish. You must then leave the road of Bear Island, and sail round the south end of Bear Point, giving a berth to the spit that runs off it, of 3 cables' length, then haul round to the N. E. into Sea-Coal Bay, and come to anchor, in 4, 5, or 6 fathoms, sandy and muddy bottom. There is also a rock under water, said to lie about 100 fathoms to the southward of Bear Island, having only 6 or 8 feet water over it; it will be necessary to give this point a good berth, for fear of this danger.

Marks for anchoring, viz: bring Bear Head in a line over Flat Head, bearing W. S. W. or W. by S., and Cariton Cliffs to bear N. by E. or N., in 5 or 6 fathoms, you will then have a good berth, sheltered from the W. N. W. and N. winds. Here is sufficient room to moor ten or twelve sail of any ships of war, from the sixth to the third rate.

ARACHAT HARBOR has two entrances; the north-western one being very narrow, ought never to be attempted without a leading wind, as there is not room for a large ship to swing to her anchors, should she be taken aback. When going in, give the ledge, to the westward of Seymour Island, a good berth, not approaching it nearer than 8 fathoms, and keep as near as possible in mid-channel; to enter by the S. Eastern passage steer for Port Marache, rounding it in 8 fathoms at about two cables' length off, and keep that shore on board at nearly the same distance and depth of water, until the church bears north; you

will then see a small house (the dead house) on the top of the hill behind the church; bring that on with the east end of the church, and then steer in that direction; you will thus pass midway to the eastward of the Eleven and Five Feet Shoals, and also to the westward of the Fiddle-head Shoal; proceed with this mark on until a red house on Fiddle-head Point comes on with the dark rocky extreme of the point, bearing E. ½ S.; you will then be to the northward of the Twelve Feet Shoal, and may haul up to the westward, where you will have excellent anchorage on fine soft mud, opposite to the low sandy beach, on the middle of Seymour Island, in 10 fathoms.

TURBALTON BAY.—Ships coming down the Gut of Canso, which may have reached past Eddy Point, or as far as Cape Argos, and caught with a S. E. to a S. S. W. wind, and cannot hold their own by beating to windward, may bear up and come to anchor in Turbalton Bay, under Turbalton Head, where they may ride safely in from 5 to 7 fathoms water, muddy bottom. The marks for anchoring in Turbalton Bay are, to bring the peninsula point in a line over Turbalton Head, bearing S., or S. ½ W., or a point of land inland, a little up in the country from Cape Argos shore, with pine trees on it, open to the eastward of the Red Head, or the said point of land with pine trees on it over the pitch or point of Turbalton Head; you are then sheltered by the rocks or spit that runs from Turbalton Head in 4 to 5 and 6 fathoms water, and will ride very safely on good holding ground. But should the wind shift to the S. W., or N. W., you must take up your anchor and beat out of the bay into Chedabucto Bay, and proceed on your passage to the southward. Should the wind overblow at S. W. so as to prevent your beating to windward into Chedabucto Bay, you may come to an anchor in Eddy Cove, bringing the lower part of Eddy Point to bear S. S. E., or S. by E., in 5, 6, or 7 fathoms water, taking care to give the ship sufficient cable, lest you drive off the bank into deep water, from 15 to 20 fathoms.

TIDES on the south side of the Gulf of St. Lawrence. The tide rushes with great rapidity through the Gut of Canso: and in the narrowest part of the gut, or Cape Porcupine, it seldom runs at a slower rate than 4 or 5 miles in an hour. Here it flows, on the full and change, at IX¼h.

Along shore, past Arbushee and Antigonish, it sets towards Cape St. George; and rounding that cape, proceeds thence in a north-westerly direction. On the south shore of Northumberland Strait, the time of flowing, on the full and change, is from VII to VIIIh. The perpendicular rise is from 3 to 7 or 8 feet.

The tides here are very materially varied by the winds; and it has been found that at times the stream of the Gut of Canso has continued to run one way for many successive days.

ST. JOHN'S, OR PRINCE EDWARD'S ISLAND.

This island is well settled, and possesses a good soil, fit for all general purposes. The climate is commonly healthy and temperate, and not subject to such frequent and heavy fogs as Newfoundland and the adjacent coasts of Breton and New Brunswick generally are, nor yet to sudden changes of weather. The first appearance of the island is like that of a forest emerging from the sea; the red cliffs, which are not very high, then appear; the lands are covered with lofty trees, and the sand hills on the northern side of the island are covered with verdure. The country is generally level, and abounds with springs of fine water, and groves of trees, which produce great quantities of excellent timber. The greater part of the inhabitants are employed in farming and fishing.

Rifleman's Shoal is situated off the south coast of the above island, and the following remarks were taken at anchor in 7 fathoms, about 2½ or 3 cables' length S. S. W. of that part on which the British ship Rifleman grounded, viz., Point Prim, N. N. W. ½ W., South Woody Island E. by S. ½ S., a point (supposed Point Jennings) N. ½ W., a merchant brig on shore on the Indian Rocks, bore S. E. about 3 or 4 miles distant.

The least water found upon the shoal was 8 feet, about half a cable's length to the northward of where the Rifleman grounded. It appears to be a rocky shoal of considerable extent.

The coast forms numerous harbors, many of which are, however, fit for small vessels only. The principal loading ports at present are on the eastern side, Cardigan Bay, or the Three Rivers, and Murray Harbor; on the S. E., Hillsborough Bay and River; Bedeque Bay on the southern side; and Richmond Bay and Holland Harbor on the north.

CARDIGAN BAY, or the THREE RIVERS, lies between Boughton Island and Panmure Island; it is the common entrance to three rivers, namely, Cardigan River, Brudenell River, and Montague River. In the former there are from 7 to 3 fathoms water, and in the others from 4 to 2 fathoms. George Town stands on a peninsula between the Rivers Brudenell and Cardigan. In these places many large ships have been loaded with timber. There is anchorage without, in Cardigan Bay, in from 10 to 15 fathoms, where a pilot may be obtained.

MIRAY, or MURRAY HARBOR lies close to the north-westward of Bear Cape; and the entrance is narrow and shoal, difficult of access, and not having more than 12

feet water. But small ships have frequently loaded here. Vessels coming from the eastward, and bound to Murray Harbor, must avoid approaching too near to the eastern point, for a ridge of rocks stretches out a full mile from it; between the east point and Wood Island the ground is clear, with a depth of 3 fathoms all the way, near the shore, and the anchorage good.

HILLSBOROUGH BAY is the finest bay in the island, and the River Hillsborough is a large navigable river; but timber here is not plentiful. After passing the front about a quarter of a mile, keep towards the entrance of York River, for a shoal extends from the opposite shore to some distance, and anchor off the town in 6 or 8 fathoms. Vessels bound for Charlotte Town, or passing through Northumberland Strait, must be careful to avoid the Indian Rocks, which are covered at high water; and by night it will always be advisable to keep on the Nova Scotia side, particularly when passing by the Island of Pictou.

BEDEQUE BAY, which lies between Cape Egmont and Carleton Point, has good anchoring ground in from 6 to 8 fathoms. The harbor will admit ships of 400 tons, but the channel is narrow, crooked, and requires a pilot. It is the chief port for loading timber; but the water freezes much sooner than at Pictou, or the harbors on the Nova Scotia coast.

Between Cape Egmont and West Cape, in Halifax or Egmont Bay, there is good anchorage with northerly and easterly winds, in 6 or 8 fathoms, but care must be taken to give a good berth to West Cape, as a shoal runs off it full 2 miles, in a S. W. direction.

From the North Cape of the island a shoal spits off nearly 2 miles, close to which there are 4 fathoms of water, and the ground is flat much farther off, there being only 6 fathoms water at the distance of 8 or 9 miles from the cape. Vessels sailing through the Strait of Northumberland, with the intention of going to any port on the northern side of the island, will, after giving the North Cape a wide berth, find all the other part of the coast clear from foul ground, to within the distance of a quarter of a mile of the land, and may anchor any where in not less than 3 fathoms water; and ships coming from the eastward will find an advantage in sailing along the northern shore of the island, to going through the Strait of Northumberland, for there is more sea room, and the prevailing winds are from the south-westward; they may safely run along within a mile of the shore, until they approach Richmond Bay. There is a reef extending from the east point of the island to the distance of 3 or 4 miles, and which should not be approached in the night nearer than to the depth of 17 or 18 fathoms. The only harbors on the north side of the island, for ships of large burthen, are Holland Harbor and Richmond Bay; and off these harbors, the sand banks, which form the bars, run off more than a mile from the shore.

ST. PETER'S is the first harbor on the north side, when coming from the eastward, and is fit for small vessels only. The bar runs out about a quarter of a mile.

Savage Harbor is fit only for small craft, and has a bar before it.

TRACADIE, or BEDFORD BAY, has about 8 or 10 feet of water on the bar, which extends outward half a mile.

HARRINGTON, or LITTLE RASTICO, admits only small vessels; it communicates with Great Rastico, or Harris Bay, which is very shallow on the bar, and calculated to admit fishery schooners only. The bar stretches off nearly half a mile.

NEW LONDON, or GRENVILLE BAY, has about 8 or 10 feet of water, but the bar is very difficult, and the channel runs in west. The bar extends nearly half a mile out.

RICHMOND BAY, or MALPEC, is a spacious harbor, having about 17 or 18 feet upon the bar. The sands which form the bar extend more than a mile off the harbor. The shoals on each side are generally discernible from the swell on them, and the course in and out is nearly east and west. On a vessel's anchoring outside the bar, a pilot will come off. There are two entrances into the bay; between them is Fishery Island. The eastern is the only channel by which a vessel of burthen can enter, the western channel being very shallow and intricate. Vessels usually complete their landing at about a mile within Fishery Island, but a considerable current runs there. The anchorage is good, and vessels lie in perfect safety.

HOLLAND HARBOR, or CASCUMPEC, is the westernmost harbor on the north side. Here the sands form a bar as at Richmond Bay, and run off about a mile and a half. The harbor may easily be known by the sand hills which extend along the coast; about half way between the entrance of Richmond Bay and Holland Harbor, is one sand-hill, near Conway Inlet, much higher than the rest. Holland Bay may be known by its being at the west end of all the range of sand-hills. There is good anchorage close to the bar in from 5 to 8 fathoms.

On the bar is a depth of 18 feet of water, and it will not be difficult for a stranger to run in with a ship not drawing more than 12 feet of water. There being two leading marks, painted white, bearing W. by N. by compass, a vessel of this draft, by keeping the two marks in one, with a leading wind, may run in with perfect safety. But as these marks will carry a vessel over the south tail of the northern sand, vessels drawing more than 12 feet should not venture without a pilot. There is a buoy on the end of the south sand;

between that and the tail of the north shoal there are 18 feet of water. Vessels entering the port, if drawing more than 12 feet of water, should not bring the marks in one till they are within the bay. The soundings off the harbor are regular, and the ground clear. Ships on coming to anchor off the bar, will immediately be attended by a pilot.

There is shoaler water between the outer and inner harbor, on which are about 14 feet of water in common tides. Vessels generally load to 13 feet in the inner harbor, and complete their cargoes in the outer one. In the former, they lie alongside a wharf at Hill's Town, in 4 fathoms water, where they lie without any current, as in a dock. In the outer harbor the spring tide runs strongly, but the water is smooth, the sea being broken off by the bar.

The CURRENTS around the island are very irregular, frequently running many days along the north coast, from east to west, and at other times from west to east.

The TIDES, also, in the north side ports, are irregular, excepting spring tides. They sometimes keep flowing for 48 hours, and at other times not more than 3. In common tides, the water seldom rises more than 2 feet; in spring tides, (except in strong winds from the northward and eastward,) not more than 5 feet.

GENERAL DESCRIPTION OF THE COASTS OF BRETON ISLAND, &c.

The N. W. coast of Breton Island, all along from Cape North to Cape Linzee, is, in the inland parts of the country, very high; but, in some places, it falls down gradually towards the shore. Sailing along on this side of the island, from the northward, you may safely stand in to the distance of two leagues from shore, until you arrive off Justau Corp, or Henry Island, when you may stand within one mile of the shore.

In the winter season, when the weather is mild, the S. E., N. E., and N. W. shores of Breton Island abound with all sorts of fish; and plenty of lobsters and oysters are to be found towards Prince Edward Island, especially in Hillsborough Bay.

The eastern extremity of Breton Island appears, on the sea shore, and to some distance up the country, barren and rocky; and the tops of the hills, being much alike, have nothing remarkable to distinguish them. The ruins of the light-house and town of Louisbourg serve, however, to point out that part of the island on which they stand. The coast continues rocky on the shore, with a few banks of red earth, which appear less barren.

The N. E. coast of Breton Island, from Cape North to Cape Ensumé, the water is deep, except very near the shore. From Cape Ensumé to Cape Dauphin is high land, but from Cape Dauphin to Scatara Island it becomes rather low: between Port St. Anne and Scatara Island, a vessel may stand in shore to 15, 10, and 5 fathoms, in clear weather, the water gradually decreasing in depth. The following soundings were taken by Capt. Philip Aldridge, on making Cape North:

	° ′		° ′		
Latitude	46 50	Longitude	59 50.....	92	fathoms, black mud.
———	46 57	———	59 57.....	85	ditto, ditto.
———	47 1	———	58 56.....	95	ditto, rocky bottom.
———	47 10	———	58 47.....	100	ditto, small red stones.

BLANCHEROTTE, or WHITE CLIFF.—On the south coast of Breton is a remarkable cliff of whitish earth. Four miles to the westward of it is a small woody island, lying at the distance of two miles from shore, and off the little harbor called St. Esprit. Without this island, at the distance of a mile and a half, on the S. E., is a breaker.

The land hence to the Isle of Madame, or Richmond, is generally low: it presents several banks of bright red earth, with beaches between them. Albion Cliff, on the south side of Madame, is rocky, remarkably high, and precipitous. On the S. W. side of this island is the settlement called Arachat.

In the description of the Gut of Canso, already given, (page 90,) we have noticed the general appearance of its coasts. On proceeding towards this strait, it should be remarked that the Isles of Canso, on the Nova Scotia side, are surrounded with many low white rocks and breakers. The south shore of Chedabucto Bay is iron bound and steep to; its north shore consists of red cliffs and beaches.

Off the Gut of Canso, from the southern entrance northward, the western shore, throughout, is high, rocky, and steep; the eastern shore low, with beaches. From the north end of the gut, the eastern shore to Jestico, or Port Hood, is distinguished by high, rocky, red cliffs. The opposite shore has several remarkable cliffs of gypsum, or plaster, which appear extremely white. Cape St. George is iron bound and very high, its summit being 420 feet above the level of the sea.

JESTICO, or PORT HOOD, situate on the western side of Breton Island, is a safe harbor for frigates with any wind; the anchorage is in from 4 to 5 fathoms, mud and sandy bottom: here you may get both wood and water. The leading mark going in, is Cape Linzee on with the highest sand-hills that are on the N. N. E. side of the beach, bearing N. by E. or N. N. E.; these kept in a line will lead you clear of Spithead, in 4 to 6 fathoms. On the opposite shore is a long and broad flat, stretching from the shore

three-quarters of a mile, called the Dean, to which come no nearer than in 4 fathoms. From hence the shore runs nearly in a straight N. E. direction to Cape St. Laurent, whence it turns easterly to Cape North: during the whole of this distance there is no harbor of note, but several salmon rivers. To the southward of Cape North, four or five miles, is Ashpée Harbor, where there is a settlement formed for the relief of shipwrecked seamen, and to the southward of that, about 30 miles, is the entrance to St. Anne's Harbor.

ST. ANNE'S HARBOR, situate on the N. E. side of the island, was called by the French, when in their possession, Port Dauphin, and is a very safe and spacious harbor. It has but a narrow entrance, and carries 4½ fathoms at low water, until you join the beach. When in mid-channel, you will have 9 to 10 fathoms, and in the harbor from 5 to 10 fathoms, muddy bottom. On the north side the land is very high, and ships of war may lie so near to the shore, that a water hose may reach the fresh water, and a ship may be loaded in one day, from a cascade which runs from the top of the rock.

For more particular directions for St. Ann's Harbor, you will observe as follows:—After you have passed the Siboux or Herford Isles, on the east side of the entrance, keep the south shore on board, if the wind be to the S. E. and as you approach Passage Point bring Cape Ensumé, or Cape Smoke, which lies to the northward, nearly on with Black Point: steer with these marks in one, until you are nearly abreast of Passage Point, off which lies a sunken rock of 6 feet water, and opposite to which begins the spit of St. Ann's Flat, and the narrowest part of the channel. Now keep a small hummock up in the country, nearest to the shelving high land to the westward of it, which hummock is on the middle land from the water-side, in a line over the fishing-hut, or fishing-stage erected on the beach: this will lead in the best water, until you enter the elbow part of the beach. When advanced thus far in, keep the opening open,(about the size of two gun-ports,) which makes its appearance up the S. W. arm. This opening looks like two steep cliffs, with the sky appearing between them, and will lead you between the beach and the south shore, in mid-channel, through 9 and 10 fathoms, and past the beach point, off which a spit stretches to the S. W. about 2 cables' length. Having passed this spit, come to anchor in either side of the harbor in from 5 to 10 fathoms, muddy bottom, and sheltered from all winds.

LA BRAS D'OR.—This place has hitherto remained unknown, and unfrequented, but having recently been visited by many vessels in the timber trade, some description may be acceptable. It appears, from the charts, there are two entrances to this lake or inlet, the Northern, or Great Entrance, and the Southern, or Little Entrance; they are thus described by Mr. Thomas Kelly, the only pilot of the place; but the names of the places he refers to are generally unknown, and cannot be applied to any publication extant.

Sailing Directions for the Grand Bras d'Or Entrance.—"Ships from the southward must give Point le Conie a berth of about two miles, and steer from thence for the eastern end of the inside Bird Island, until you bring M'Kenzie Point and Cary's beach in one. Make for the Black Rock Point until you have Messrs. Duffus's Store just open of Point Noir; then steer for Gooseberry Beach, until you bring a clearing on Duncan's Head over M'Kenzie's Point. It is to be observed, that ships coming in with the tide of flood must keep Point Noir well aboard, to avoid the eddy and whirlpools on the north side of the Gut, which has various settings. You must then steer for Point Jane, to keep the fair stream of tide as far as Round Cove, where there is fair anchorage in 7 or 8 fathoms, good holding ground. When abreast of the Round Cove, steer over for Duncan's Head; and when abreast of this Head, steer for Long Beach, until you bring a tall pine tree, on the Upper Seal Island, in one with a notch or valley in the mountain. You will then make for the point of the Upper Seal Island, which will carry you clear of the shoals on the islands, as also the South Shoal, or Middle Ground. The marks for this shoal are a white rock in the bank for the eastern end, and a white birch-tree for the western end. When abreast the western end of this shoal you may keep the middle, there being no difficulty until you come to Red Head. If bound to Kent Harbor, after doubling the Red Head, steer for a remarkable red bank covered with small bushes, until you bring Mr. Duffus's house entirely open of the beach which is on the island; there is a depth of from 4 to 5 fathoms in this harbor, and good holding ground."

Directions for that arm of the Lake called St. Patrick's Channel and up to Whookamagh.—"From Red Head you will steer well over for the Duke of Kent's Island, to avoid a mud shoal which runs off from M'Kay's Point. When abreast of the western end of the Duke of Kent's Island, sail for Wassaback Head until abreast of Stony Island. Then steer for Cranberry Head, so as to clear a shoal lying off from Wassaback Head; when abreast of Cranberry Point, sheer well over for the Bell Rock, to avoid a shoal lying on the south side of the channel; when abreast of the Bell Rock, steer for Green Beach, observing to keep Bakdock River shut in until you are well up with Green Beach. You will then steer for a beach on the south shore, until you cross the opening of the Narrows; you may then sail through the Narrows, keeping the middle until you come to the western end, when you must haul round the southern shore (beach) until abreast of the Plaister Cliffs; you are then clear of all, and in the Wookamagh Lake."

Of the Anchorage through the Bras d'Or.—"The first anchorage is the Round Cove, where you may ride in 7 or 8 fathoms. You may anchor in 5 or 6 fathoms, in the centre of the harbor, on a middle ground; the marks for which are to bring the Table Island a handspike's length open of Black Rock Point and Point Jane bearing N. W. On the north side of the harbor there is good anchorage as far up as the Lower Seal Islands, and to the eastward of the Upper Seal Islands, in 5 fathoms, and to the westward of the same islands in 7 fathoms. There is no other place of anchorage from this to the Big Harbor, where you may ride in 7 or 8 fathoms; from thence you may anchor at any time."

Setting of the Tide in Grand Bras d'Or.—"The first quarter flood sets from the northward, directly over the shoal; last quarter W. S. W. being directly through the channel, and meeting with the tide coming over the shoal, sets towards the Black Point, which occasions it to shoot across the Gut, making a number of whirlpools and strong eddies on each side of the channel, which slacks two or three times during the tide. The first quarter ebb sets over the shoal to the northward; last quarter directly through the channel.—N. B. The tide of ebb is the fairest setting tide. The tide runs in until half-ebb, and out until half-flood, in regular tides; but the winds make a great alteration, N. E. winds making high tides, and S. W. neaping them; also tides running out with S. W. winds until high water, and in until low water with N. E. winds. Tides rise four feet, unless affected by winds. High water ten minutes past 8 o'clock, full and change."

SYDNEY HARBOR, the entrance to which lies 4 leagues to the S. E. of that of St. Ann, is another excellent harbor, having a safe and secure entrance, with soundings regular, from sea in 5 fathoms. On a low point which you leave on your larboard hand going in, a light-house painted red and white vertically, is erected, showing a fixed light, elevated 160 feet above the level of the sea.

Entering the harbor, give the point a berth of one-third of a mile, and steer W. S. W. when you will have from 7 to 9 fathoms water; within the point the shore is bold and perfectly safe.

In the inner part of the entrance, Beach Point and Ledge, on the south side, are steep to, but Sydney Flats, on the opposite side, are regular to 4 fathoms. When past the Beach Point, you may run up the river Dartmouth to the S. W., and come to anchor in any depth you please, to 5 and 10 fathoms, a fine muddy bottom.

The harbor of North Sydney, where the vessels are loaded with coal by lighters, lies 9 miles above the light-house on the north side of the river. The coal is obtained three miles above the light-house, on the same side of the river as the town. There is a steam engine at the coal mines, with three very tall chimneys, the smoke of which can be seen 8 or 9 miles at sea on a clear day. The tide in the harbor flows at 9h. and rises 6 feet.

West of Sydney Harbor are Indian Bay and Windham River, both places of anchorage, and fit for vessels to run into.

BRIDGEPORT HARBOR, formerly LINGAN.—The leading marks for entering the harbor are, the end of the sand-beach and Roach's Farm-house in a line. Roach's Farm may be easily distinguished, being the only one that presents a group of buildings; which are also situated on higher ground than any of the farms on the north side of the harbor.

The cliffs on the southern shore of the bay are precipitous, but not more than 30 to 50 feet high; and the land covered with wood, with the exception of a small clearing on the eastern point, and is covered with spruce and fir trees.

From Flint Island, the North Head bears N. W. ½ W., by compass, distant 11 miles.

A Pilot can always be had by making the usual signal.

There are 11 feet of water in the shallowest part of the mid-channel at high water neap tides, and 13 feet at spring tides.

At full moon and change it is high water in the channel at half-past eight o'clock.

MURGAIN, or COW BAY, at the northern point of which is Flint Island, there is a passage between this island and the main, with 14 fathoms water, but this should be adopted with the greatest caution, on account of the numerous rocks under water that are scattered about: this bay is open to the north-eastward, and its further end is encumbered with an extensive shallow flat, which dries at low water.

Miray Bay is to the southward, and its entrance is bounded by Cape Murgain and the Island of Scatara; the bay is wide, and runs in 3 leagues, branching off at its upper part into two rivers; there is deep water within it, from 20 to 6 fathoms, and clear from dangers, but it affords no shelter for shipping.

SCATARA ISLAND lies in about the latitude of 46° north; its length E. and W. is nearly 2 leagues, and its breadth about one; it is separated from Cape Breton by a channel into Miray Bay, but this is too hazardous for strangers, and frequented only by those coasters who are well acquainted with its dangers.

On the N.E. point of this island there is a light-house, *white*, containing a revolving light 90 feet above the level of the sea, visible one minute, invisible half a minute.

Ships should not approach this light on any bearing between N. N. E. or S.E. by S., or run nearer than within two miles.

LOUISBOURG HARBOR is situated on the S. E. side of Cape Breton, to the westward of Scatara Island, and is very easy of access; you may be soon in, and you may likewise be soon out, if you please. In doing so, be careful to avoid the Nag's Head, a sunken rock on the starboard hand going in. The east part of the harbor is the safest. On the east head, and on the site of the old French light-house, a White Beacon has been erected; it may be seen some distance. The inhabitants consist of a few fishermen only. Water is plenty here, but wood is scarce. The Nag's Head Rock lies nearly one-third from the light-house point, and has no more than 3 feet on it at low water. The larboard side going in is the boldest.

GABARUS BAY.—From the entrance of Louisbourg to Guion Isle, called also Portland Isle, the course is S. W. by W., and the distance more than 3 leagues. Between lies the bay called Gabarus Bay, which is spacious, and has a depth of from 20 to 7 fathoms. Off the south point of this bay, called Cape Portland, lie the Cormorants, a number of islets and rocks, which are dangerous. About 4 leagues to the westward of Gabarus Bay is the Forked Harbor, a narrow winding inlet, where small vessels may run into, and lie landlocked. And five miles S. Westward of this is the remarkable white cliff, already noticed, and called Cape Blancherotte. The shore now winds to the westward, to Cape Hinchinbroke and the Isle of Madame.

CHEDABUCTO BAY is wide and spacious; it is bold to on both shores, and free from danger: on its southern side, which is high and nearly straight, are Fox's Island and Crow Harbor. Fox's Island is small, and lies near the shore.

FOX ISLAND Anchorage is one of the greatest mackerel fisheries in North America, during the months of September and October. When sailing in you must pass to the westward of Fox Island, giving it a berth of a quarter of a mile, as there are rocks both above and under water, with 3 and 4 fathoms close to them. You may anchor in from 4 to 10 fathoms, with the west end of the island bearing from E. N. E. to N. N. E., keeping about midway between the island and the main. The water shoals gradually to the bar, which extends from the island to the opposite shore; it has not more than 6 or 7 feet on its deepest part, and dries in one place about one-third of the distance from the island to the main; with northerly and with westerly winds, the fishing vessels ride to the eastward of it in from two to four fathoms, and shift to the westward with easterly winds.

CROW HARBOR is situated on the south side of Chedabucto Bay, and is capable of containing ships of war of the 6th and 5th rates, merchant ships, &c. Many schooners and sloops resort here in the months of July and August, to take mackerel and herrings. The passage in is to the S. W. of the island that lies in the entrance. On the south side of the beach a beacon is erected, to lead ships clear of the Corbyn Rocks. Keep this beacon in a line with a remarkable tree upon the high land, and it will lead you also clear of the Rook Island Rock, that lies 25 fathoms from the N. W. point of Rook Island.

MILFORD HAVEN, or the Harbor of Guysborough, at the head of the bay, is impeded by a bar, but a sloop of war may pass over it. Within the bar vessels lie in perfect security; the tide, however, sets in and out with great rapidity. The town is at present a place of little trade; but it is protected by a battery. A little to the southward of Guysborough is Salmon River, which rises a considerable way up the country, and contributes to fertilize an extensive tract of good land. From Manchester round the north shore of Chedabucto Bay, the shores are full of settlements, and wear a pleasing aspect, and on the northern side of Chedabucto Bay you will see several red cliffs; this shore is sandy, with regular soundings in the middle of the bay; the water is deep, from 25 to 35, &c. to 50 fathoms.

At Milford Haven, it is high water full and change at 8½h., and the common spring tides rise 8 feet. At the Bay of Rocks at 8¼h., rising 7 and 8 feet; and, at the Gut of Canso, at 8½h., common spring tides rising 5½ feet.

THE SOUTHERN COAST OF NOVA SCOTIA.

CHEDABUCTO BAY TO HALIFAX HARBOR.

DESCRIPTION OF THE LAND.—The eastern part of Nova Scotia is broken into the several islands and passages as represented on the charts. Of the islands, which are low and covered with stunted fir-trees, the first on the N. E. is called Durell's Island, the second George's Island, and the third, Canso or St. Andrew's Island; outside this latter island is the smaller one, called Cranberry Island, which is now distinguished by a light-house, painted red and white, horizontally, containing a fixed light.

CAPE CANSO is the outer, or easternmost point of St. Andrew's Island. From this cape, westward, to Torbay, the coast makes in several white heads or points; here the

country is much broken; and near the S. E. extremity many white stones appear from the offing, like sheep in the woods. During a southerly gale the sea is dreadful here. From Torbay to Liscombe Harbor there are banks of red earth and beaches; and from Liscombe Harbor to the Rugged Islands, (excepting the White Isles, which are white rocks,) the capes and outer islands are bound with black slaty rocks, generally stretching out in spits from east to west; and from the Rugged Islands to Devil's Island, at the entrance of the Harbor of Halifax, there are several remarkably steep red cliffs, linked with beach.

The fishermen of Arachat are well acquainted with the channels and inlets on this coast, and frequent them, more particularly in the spring and fall, to catch mackerel and herrings, of which large shoals commonly resort here; but the rocks are so numerous, and the passages so devious, that no stranger should attempt them.

Of the many rocks hereabout, the outer breaker, called the Bass, a rock of 3 feet water, lies more than two miles E. ½ S. from the light-house on Cranberry Island. At seven-tenths of a mile S. E. from Cape Canso is a similar rock, called the Roaring Bull; and, at one mile to the E. S. E. of the latter, there is said to be another, discovered by a fisherman of Canso, in 1813; but its existence seems to be questionable.

CANSO HARBOR.—Sailing from the westward into this harbor, so soon as you have passed the Roaring Bull, over which the sea generally breaks, run for Pitipas, or Red Head, taking care when above the Black Rocks, to keep them open of the rocky islets off Cape Canso, until you bring Glasgow Head and the north end of Inner Island in one, which will carry you above Man-of-war Rock; then steer westerly, being careful to avoid Mackerel Rock, and make for Burying Island, the north end of which you must not approach nearer than to have a depth of five fathoms; then anchor to the north-westward of it, on a bottom of mud.

St. Andrew's Passage, leading to Glasgow Harbor, being so thickly encumbered with rocks, can only be navigated by those who are well acquainted with its dangers.

Coming from the eastward, pass between Cape Canso and Cranberry Island, giving the latter a sufficient berth to avoid a shoal which stretches to the southward of it, and steer for Pitipas Head, as before directed. The Northern Passage, between Durell's and George's Islands, notwithstanding its narrowness, yet having a depth of water, and a clear channel, will be found to be the best passage. In sailing in, keep mid-channel between Bald and Net Rocks, the former being above water, and the latter drying at one-quarter ebb, when you may steer with safety by attending to the chart, and the situation of Burying Island. At Cape Canso it is high water, full and change, at 50 minutes after 8 o'clock, and the tides rise from 5 to 8 feet.

DOVER BAY is a wild deep indent, with a number of islands and sunken rocks at its head: yet shelter may be found on the western shore, or during a south-east gale, by giving a berth to the rocks that lie off the south end of Big Dover Island; these are very visible in bad weather; haul up under the island, and anchor between the small islands on the eastern side; within these islands Little Dover Passage continues out south-eastward, having 5, 6, and 7 fathoms water, and quite safe.

Eastward of Little Dover is St. Andrew's Channel, for which no directions can be given, for even those who are well acquainted with the navigation, cannot keep themselves clear of the rocks. This channel leads to Glasgow Harbor, which is, in fact, a part of Canso Harbor.

These places, says Mr. Lockwood, deserve notice, as they may afford shelter in cases of emergency, and in war time are nests for privateers; while from the heights adjacent may be had an extensive view of whatever passes in the offing.

RASPBERRY HARBOR is to the westward of that of Canso, or Port Glasgow: it is small, and the shore is within quite bold. At the entrance, on the eastern side, is an island, having a ledge close to it on the S. E. By rounding this ledge, you may steer directly into the harbor, and come to an anchor under the island which lies in the middle of it, in the depth of 7 fathoms, where you will ride safely. The country here is rocky and barren, and there is a quarry of granite, much in request for millstones. The outlet between Raspberry Island and the main is a complete dock, where vessels can lash themselves to both shores, and ride in 30 feet water; but half way through it has only 10 feet.

WHITE HAVEN, which is two leagues to the westward of Raspberry Harbor, is a place of hideous aspect. Of its rocky islets, the larger and outer one, called White Head, from the color of its sides, is 70 feet above the level of the sea. This islet appears round and smooth, and is a useful mark, as the passage in, on either side, is in mid-channel, not difficult to navigate, and the anchorage is good throughout, in a muddy bottom. Off the head are two breakers, one S. S. E., and the other E. by S., half a mile off.

TORBAY.—The entrance of this bay is formed on the west by a bold headland, called Berry Head. The channel in is between this head and the islands to the eastward. E. S. E. from the head, and south of George's Island, are three very dangerous rocks, which do not break when the sea is smooth. Within the bay, under the western peninsula, there is excellent anchorage, in from 6 to 4 fathoms, muddy bottom, up to the east-

ern part of the bay; there is also anchorage on the western side of the bay, in from 7 to 3 fathoms, similar ground, where a vessel may lie in safety during any gale. The adjacent lands are rocky, but vessels are built here of from 40 to 120 tons, which are employed in the fisheries.

The principal dangers to be avoided in entering, are the small sunken rocks in the offing, which in smooth water do not break; they should be left to the eastward. Within the bay the anchorage is excellent, in a muddy bottom, with the exception of a few spots of rocks, sheltered from every wind.

Torbay to Country Harbor.—From Torbay, westward, to Country Harbor, the land, in general, continues rocky and sterile, with deep water close in, but regular soundings without, and from 30 to 20 fathoms of water.

Coddle's Harbor, which is 3½ leagues to the westward of Berry Head, affords shelter to small vessels only; and these enter on the eastern side, to clear the breakers. There is a deep inlet, called New Harbor, which lies about 7 miles from the islands, and connected with a chain of extensive lakes; but its navigation is obstructed by a bar across its entrance, and it is open to southerly winds.

NEW HARBOR.—This place is so much exposed, that even small vessels which occasionally resort there in the fishing season, are under the necessity of leaving it the moment a southerly wind arises.

Inland Harbor lies between Harbor Island and the main, and affords excellent anchorage on a bottom of mud; it is particularly convenient for going to sea with almost any wind.

Isaac's Harbor is on the north-east side of Country Harbor, and has good holding ground, with sufficient depth of water for any vessel. Between Isaac Harbor and Harbor Point the ground is foul and rocky.

COUNTRY HARBOR.—The fine harbor, called Country Harbor, is navigable for the largest ships, twelve miles from its entrance. It is, at present, but thinly settled, yet there are reasons for believing that, in consequence of improvements in the neighborhood, the population will speedily increase. The shores are bold; the anchorage soft mud, with a depth of 13 to 5 fathoms. Mr. *Lockwood* has said that, "no position in the province is more advantageous for settlers than this harbor; at its mouth the islands afford shelter to fishermen and small vessels, as well as the means of erecting their stages; and the fishing grounds, at a short distance in the offing, abound in halibut, haddock, cod, and what they term the bait-fishery; that is, mackerel, gaspereux, smelts, &c. Salmon are plentiful in their season; and, but for the improvident use of this valuable addition to the means of subsistence, would continue for ages." The ledges off the harbor generally break, and between them are deep passages. On advancing from the eastward, there are two rocks to be avoided, which lie as shown on the charts; proceeding inward, you should give Green Island a small berth, and the dangers on that side will be avoided. The rocks on the west of the entrance, named Castor and Pollux, are above water and bold to. When above them give Cape Mocodame a good berth, so as to avoid the Bull, a dangerous sunken rock, that breaks in rough weather, and lies about half a mile from the extremity of the cape. The black rocks are partly dry, and from them upwards, there is no danger, and the anchorage is good. Vessels entering this harbor, must use the utmost caution in steering between the ledges and rocks which are scattered about; fortunately they commonly show themselves whenever there happens to be any sea; this will render the entrance less difficult; but having passed the Black Ledge, which is the innermost danger, the navigation will be perfectly safe for the largest fleet. The tide is scarcely to be perceived, except when in the spring the ice and snow dissolve, and heavy rains are prevalent. At the entrance of Country Harbor it is high water on full and change at 8h. 40m. Tides rise from 6 to 9 feet.

FISHERMAN'S HARBOR.—In entering this place between Cape Mocodame and the Black Ledge, great care must always be taken, in order to avoid the Bull Rock, which dries at low water, but is covered at high water, and only breaks when the weather is bad.

HARBOR ISLAND.—The islands on the east side of the entrance, Green Island, Goose Island, and Harbor Island, or the William and Augustus Islands of Des Barres, are low and covered with scrubby trees. Within Harbor Island is excellent anchorage.

BICKERTON HARBOR, to the west of Fisherman's Harbor, is fit for small vessels only. At two miles to the west of it is Hollin's Harbor, a place of shelter for coasters, and resorted to by the fishermen. Indian Harbor is a shallow and unsafe creek, but has good lands, well clothed with pine, maple, birch, and spruce. The next inlet, called Wine Harbor, has a bar of sand, which is nearly dry. There are a few, and but few, settlers on these harbors.

ST. MARY'S RIVER.—The navigation of this river is impeded by a bar of 12 feet water, which extends across at the distance of a mile and three-quarters above Gunning Point, the west point of the entrance. Below the bar, towards the western side, is a middle ground, which appears uncovered in very low tides; and, above the bar nearly in

mid-channel, is a small rocky islet. The passage over the bar is on the eastern side of this islet. The tide, which is very rapid, marks out the channel; the latter is devious, between mud-banks, extending from each shore, and dry at low water. The depths upward are from 24 to 18 feet. Sailing in you should proceed for 4 miles N. N. W., then 2 miles N. by W., and afterwards N. N. W., to the Fork, where it divides, the western branch terminating in a brook; the eastern branch continuing navigable a quarter of a mile further up to the rapids. The town of Sherbrook is, at present, a small village at the head of the river, about three leagues from the sea.

WEDGE ISLE.—The islet called Wedge Isle, which lies at the distance of half a league south from the S. W. point of St. Mary's River, is remarkable, and serves as an excellent guide to the harbors in the neighborhood. The side of this islet, towards the main land, is abrupt, and its summit is 115 feet above the sea. From its S. W. end ledges stretch outward to the distance of half a mile; and some sunken rocks, extending towards it from the main, obstruct the passage nearly half way over. About 2½ miles south from the Wedge, is a fishing bank of 30 to 20 feet, the area of which is about 200 acres.

JEGOGAN HARBOR may be readily found, on the eastward by Wedge Island, and on the westward by the bold and high land, called Redman's Head. The passage in is easy, at the distance of a quarter of a mile from the head, and anchorage good, in muddy bottom. Three-quarters of a mile from it is a dry ledge, called the Shag.

LISCOMB HARBOR.—The entrance of this harbor, which is one of the best on the coast, is between Liscomb Island and the head-land on the west, called Smith or White Point. From the S. E. end of Liscomb Island, a ledge, with breakers, extends to the distance of three-quarters of a mile. Within and under the lee of the island is safe anchorage in from 13 to 8 fathoms. On the N. E. of the island, a vessel caught in a S. E. gale may be sheltered by Redman's Head, already described, with the head S. S. E., in 6 and 7 fathoms, on a bottom of clay.

On the west side, the ground from Smith Point is shoal to the distance of nearly a mile S. S. E., and at 2½ miles south from the point is a rock, on which the ship Black Prince was lost. It constantly breaks, and is partly uncovered. The island-side is bold. The first direction of the harbor is nearly north, then W. N. W. Opposite to the first fish-stage, at half a mile from the shore, is as good a berth as can be desired, in 7 fathoms. From this place the harbor is navigable to the distance of four miles: it is, however, to be observed, that there are two sunken rocks on the north side. At Green Bay (Liscomb Harbor) spring tides rise 7½ feet, neaps 4½.

BAY OF ISLANDS.—The coast between Liscomb and Beaver Harbors, an extent of 6 leagues, is denominated the Bay of Islands. Within this space the islets, rocks, and ledges are innumerable: they form passages in all directions, which have, in general, a good depth of water. At the eastern part of this labyrinth, near Liscomb, is Marie-et-Joseph, an excellent harbor for the largest ships, but requires caution to enter. Nicomquirque is a small settlement in the same range, the inhabitants of which are an industrious set of people. Newton-quaddy, next east of Beaver, is scarcely fit for any but fishing and other small craft, as the channel in is rocky and narrow.

The White Islands, nearly half way between the harbors of Beaver and Liscomb, appear of a light stone-color, with green summits. The latter are about 60 feet above the level of the sea. The isles are bold on the south side; the passage between them safe: and there is good anchorage with them, in from 10 to 7 fathoms. From these the rocks and ledges extend five or six miles from E. to E. N. E.; they are bold to, and mostly dry, the water within them being always smooth.

BEAVER HARBOR.—The Pumpkin and Beaver Islands are very remarkable to vessels sailing along the coast, particularly Pumpkin Island, which is a lofty and dark barren rock; but they afford a smooth and excellent shelter inside of them during a southerly gale. Southerland Island has, on its N. W. side, a deep and bold inlet, where a vessel may lie concealed and secure as in a dock. When in the offing, the harbor is remarkable on account of the small island which lies north of the Black Rock, having at its southern end a red cliff, being the only one on this part of the coast; having entered the harbor, you may choose your anchorage, according to the direction of the wind, the bottom being generally mud. The basin on the west side is so steep to, that a small vessel may lie afloat, her side touching the beach.

The harbor is too intricate to be recommended to a stranger.

SHEET HARBOR.—This harbor is nearly half-way between Country Harbor and Halifax. It is dangerous for vessels to approach in thick weather. The narrow channel between Sober Island and the main, affords secure anchorage, on a bottom of mud.

Without the harbor are several ledges, which show themselves, excepting the outer one, called by the fishermen Yankee-jack, and which, when the sea is smooth, is very dangerous. It has been asserted, that a rocky shoal lies half a mile to the south of the Yankee, but its position has not been ascertained.

Within the entrance is a rock, two feet under water, which will be avoided by keeping the Sheet Rock open of the island next within it, on the eastern side. In sailing or turn-

ing up the harbor, give the sides a very moderate berth, and you will have from 11 to 5 fathoms, good holding ground.

The flood at the entrance of Sheet Harbor sets S. S. W. about one mile an hour. High water, full and change, at 8h. 50m. Tides rise 7 feet.

MUSHABOON, to the westward of Sheet Harbor, is a small bay, open to the S. E., which affords shelter at its head only, in from 7 to 5 fathoms, muddy bottom. It is connected to Sheet Harbor by a clear, deep, and bold passage, between an island and the main land, not having a shoal or obstruction in it. Here you may lash your vessel to the trees, and, lying in 5 fathoms, soft bottom, with the side touching the cliff, be perfectly sheltered from all winds. This place is uninhabited, the land being incapable of cultivation. In going through the passage to Sheet Harbor you must guard against a sunken rock at its mouth, which, from the smoothness of the water, seldom shows its position; this rock lies 400 yards off Banbury Islands, and may easily be cleard by keeping the Sheet Rock open of the island.

SPRY HARBOR has on each side of the entrance, a high, rocky, barren cape, distinguishable at a long distance. When sailing in you will perceive the land in the centre of the harbor, appearing in three distinct hills; keep the valley between the two easternmost on with the Bald Rocks, which will lead you between Mad Moll Reef and Maloney Rock; you may now steer in for the anchorage, at the western head of the harbor, where a fleet may be land-locked, in a muddy bottom.

This harbor is open to S. E. and E. S. E. winds. At the entrance, the flood-tide sets in at about one mile an hour. The tide, at the entrance of Spry Harbor, sets in with the velocity of about one mile an hour.

DEANE, or POPE'S HARBOR, on the western side of Gerard's Isles, above mentioned, has a ledge at its entrance, forming an obtuse angle at the two points, three-fourths of a mile from each, and from which a shoal extends to the southward half a mile. It may be passed on either side: but, on the west, care must be taken to avoid a shoal extending from the outer Tangier Island. The best shelter is under the smaller island on the eastern side, where there are from 8 to 6 fathoms, with bottom of blue clay, mud and sand.

TANGIER HARBOR, next to Dean or Popes, is formed by craggy barren islands, which secure vessels from all winds. At about two miles from its mouth is a ledge that dries at low water. The anchorage is under the eastern shore, above Fisher's Nose, in 5 to 4 fathoms, stiff mud. Here are some good tracts of pasture land, and the few inhabitants are occupied in the fishing and coasting trade.

SHOAL BAY is the Saunders Harbor of Des Barres. This bay has a good depth of water and excellent anchorage, on fine white sand and strong mud. The latter is to the northward of the island now called Charles Island, and vessels lie in it, land-locked, in 7 fathoms. Off the mouth of the harbor is a rock, that always breaks; but it is bold to, and may be passed on either side. Some parts of the harbor will admit large ships to lie afloat, alongside the shore, over a bottom of black mud. Supplies of stock, &c. may be obtained from the inhabitants of this place.

SHIP HARBOR is easy and safe to enter, having good anchorage in every part, the bottom being a tough clay of bluish color; it leads to Charles's River, above the narrows of which a fleet of the largest ships may lie alongside of each other, without the smallest motion. In this harbor, and on the isles about it, are near twenty families, who keep small stocks of cattle, &c. The entrance, called by Des Barres Knowles' Harbor, is deep and bold: it lies between two islands, of which the eastern is Brier's Island, on the western part of which is a light-house. A white cliff, which may be seen for a considerable distance in the offing, is a good mark for the harbor: at first it resembles a ship under sail, but on approaching seems more like a schooner's top-sail. Brier's Island, before mentioned, is a low rugged island, and ledges partly dry, extend from it three-fourths of a mile to the eastward: avoiding these when entering this way, you may range along the western island, and come to an anchor under its north point, in 6 or 7 fathoms, the bottom of mud. Ship Harbor, proper, commences about 7 miles to the N. W. of Brier's Island, at a beach in the western shore, which has 6 fathoms close to its side; its entrance is one-third of a mile broad, widening as you ascend it: above Green Island are some shoals and ledges, but the anchorages below them are capacious and good. Spars, stock, water, and firewood may be obtained here.

OWL'S HEAD, or KEPPEL HARBOR, which is next to the west of the harbor last described, although smaller than many other harbors on the coast, has sufficient space for a fleet. It may be known, at a distance, by Owl's Head, on the western side, which appears round, abrupt and very remarkable. The neighboring coast and isles are rugged and barren, but the harbor has a few settlers. The entrance is of sufficient breadth to allow a large ship to turn in it; and, within the harbor, shipping lie land-locked, when in 6 and 7 fathoms, with a bottom of mud. In taking a berth, you will be guided by the direction of the wind; as, with a S. W. gale, the western anchorage is to be preferred, and the eastern with a S. E. The tide sets into this harbor from the S. W. at the rate of one mile an hour.

LITTLE HARBOR is somewhat to the westward of Owl's Head Harbor, and is a place of safety for small vessels; but its entrance is intricate, and requires a good knowledge of the passages leading to it, in order to enable a vessel to enter.

JEDORE HARBOR.—In the offing, at the distance of two leagues off the land, the body of the flood sets in S. W. by S., at the rate of half a mile an hour. From the appearance of this harbor on the charts, it might be presumed that it is spacious and commodious; but on examination, it will be found to be really different. The entrance is unsafe and intricate; a shoal of only 11 feet lies at its mouth; the channel within is narrow and winding, and there are extensive mud flats, covered at high water, and uncovered with the ebb: hence a stranger can enter with safety only at low water, the channel being then clearly in sight, and the water sufficient for large ships. The best anchorage is abreast of the sand-beach, two miles within the entrance. in from 9 to 6 fathoms, on a bottom of stiff mud. Two and a half miles above the beach the harbor divides; one branch to the larboard is navigable nearly to its extremity, and has several sunken rocks on it; while to the starboard is a large space with a clear bottom, and from 3 to 5 fathoms. On the eastern shore are Oyster Pond and Navy Pool, two deep inlets, but choaked at their entrance by a bed of rocks; the river terminates with a rapid.

The lands at the head of the harbor are stony, but tolerably good; the rest barren and deplorable.

Without the entrance, on the eastern side, are two isles, called Roger and Barren Islands, between and within which the passages are good, and afford shelter in case of necessity; from these the land runs nearly E. N. E., and forms a deep inlet, called Clam or Clamb Bay.

THE BRIG ROCK.—This is a very dangerous rock of 3 feet, about the size of a frigate's long boat; it lies S. E. ½ E. from Jedore Head, and S. W. two miles from the isle called Long Island. The weed on the top of it may frequently be seen at the surface. The marks for this rock are a house and barn in Clam Bay, just open of the east end of Long Island, bearing N. 5° E., and the house on Jedore Head open to the N. E. of Jedore Rock.

An account is given of a rocky shoal over which a vessel passed in 8 fathoms water, and upon which were taken the following bearings: Jedore Head N. N. W. ½ W.; west end of Long Island N. E. by N.; and Jedore Outer Ledge or Brig Rock, E. by S. This shoal may have less water upon it in other parts, but as these bearings do not agree with the chart, we apprehend there must be some error in its exact position. Mention is also made of a rock, bearing from Jedore Head S. 38° E., distant 6 miles; this has only 5 feet over it, and 22 fathoms close within and without it. This is supposed to be the Brig Rock, but if so, the bearings are not correct. These two notices are inserted to show that some dangers exist hereabout, and will be sufficient to warn the mariner to search for and cautiously avoid them.

It is high water at Jedore Head full and change at 20 minutes after 8 o'clock, and the tide rises from 6 to 9 feet. At Owl's Head, it is high water at 30 minutes after 8 o'clock, and the tide rises from 5 to 7 feet.

POLLUCK SHOAL.—At about nine miles south from Jedore Head is a reef, called the Polluck Shoal; its area is about one acre, having a depth of 24 feet over it; and, during a swell, the sea breaks on it with great violence.

JEDORE LEDGES.—Those advancing between the Brig Rock and Polluck Shoal, should be cautious in approaching any of the Jedore Ledges: they are laid down on the charts, and said to extend from 5 to 9 miles from the mouth of the harbor.

Between Jedore and Halifax, there are no harbors of any consideration for shipping, but there are numerous settlements. The land in this extent is, in general, of moderate height, rising gradually from the shore. Red and precipitous cliffs, the characteristic of the eastern coast, may be seen from seven to nine miles off. The best harbor is that called Three Fathoms Harbor. When you are within this harbor the passage will be found to be clear, between banks of soft mud. But it is only fit for schooners and sloops, although it has occasionally been visited by large vessels. The anchorage is tough blue clay. The cliffs are composed of bright red earth, remarkable for vessels coming from the eastward. This harbor lies immediately to the east of an islet called Shut-in Island; and, with the wind on shore, is difficult and dangerous; so that it is to be attempted only in cases of real distress. The channel lies two-thirds over to the northward from Shut-in Island, and turns short round the starboard point to the westward.

In beating to windward, ships may stand to within a mile and a half of the shore, the soundings being tolerably regular, from 20 to 12 and 8 fathoms. Captain Aldridge says, "we made the land to the windward of Jedore Ledges, which bore E. S. E., and saw an island, appearing white along the bottom; between this and another island lay Jedore, a large rock, to the eastward; the island was quite white round the bottom, and had a thick green wood at top; to the westward of the westernmost of these islands, is Owl's Head, a large high bluff land; the western part of it is a darkish white, with a patch of red. A little to the eastward of this red patch are two houses, situated in Clamb Bay, to the west

of which is a sandy beach. In coming from the bank we had 45 fathoms, stones, then 37, 39 and 40 fathoms, mud and small pebbles."

HALIFAX TO CAPE SABLE.

GENERAL REMARKS.—Vessels coming from the eastward, and bound for the harbor of Halifax, should pay particular attention to their soundings, especially when they consider themselves in the neighborhood of Sable Island; which island and its surrounding banks we shall hereafter describe; it will therefore only be necessary at present to remark, that the island is low, and appears like small sand hillocks; that, in summer, it frequently is enveloped in a fog, but you may always discover your proximity to it, by your soundings; and that on its N. E. and N. W. sides are dangerous bars; you will have, except on these sides, 2 fathoms, 2 cables' length off, and your depth will increase in proportion to the distance you are from it, at a general rate of about 2 fathoms for every mile, until you are more than 20 miles from it. Signals are placed on the island, and also a gun to answer such as may be heard from vessels in distress, or in thick weather, which have already saved from shipwreck a number of vessels.

In making land more to the south-westward, and about Cape Sable, you must be particularly careful to avoid Seal Island Rocks and the Brazil Rock. To the westward of Great Seal Island, the soundings are very irregular for upwards of 20 miles, at which distance are 45 fathoms, gravel and stones. Indeed, the soundings along Nova Scotia, from Cape Canso to Cape Sable, partake of the same irregularity, from 25 to 50 fathoms, therefore you should not come nearer the land than 35 fathoms, unless you are well assured of the exact part you are in, for otherwise, endeavoring to enter Halifax, you may be driven into Mahone or Mecklenburgh Bays, and be caught by S. E. winds. The weather is generally foggy 4 or 6 leagues off shore, both in spring and summer; but it becomes clearer as you get nearer the coast, and with the wind off the land it will be perfectly clear.

From one to three leagues out to the seaward, mackerel, halibut, rays, haddock, and cod are found in plenty; and at the entrance to the harbors and rivers, salmon are taken from April to August; the bays abound with herrings in June and July, and with tom-cod all the year round.

Mariners may always know their approach to, and arrival into, soundings by the increasing coldness of the water.

HALIFAX, the capital of Nova Scotia, is large enough to accommodate any quantity of shipping in perfect safety. Its direction lies nearly N. and S., being about 16 miles in length, and terminates in Bedford Basin, which is an extensive sheet of water, containing 10 square miles of safe anchorage. The town is situated on the declivity of a peninsula at the western side of the harbor, about 10 miles from its entrance.

HALIFAX HARBOR.—In approaching the harbor of Halifax, you will perceive the coast about its environs, particularly to the southward, to be ragged and rocky, with patches of withered wood scattered about, but the land is rather low in general, and not visible 20 miles off, except from the quarter deck of a 74; the high mountains of Le Have and Aspotogon excepted, which may be seen 9 leagues off. When Aspotogon Hills, which have a long level appearance, bear north, and you are 6 leagues distant, an E. N. E. course will carry you to Sambro light-house; this stands on Sambro Island, and is on a high tower, painted white, elevated above the sea 210 feet; there are two 24 pounders placed on the island, under the direction of a small party of artillery men; these are fired on the approach of vessels, and contribute much to the mariner's safety by warning him off the adjacent breakers. Sambro Island and light-house lie on the S. W. side of the entrance to the harbor. In standing in for the land you may know on which side of the harbor you are, by a remarkable difference that takes place immediately from its mouth in the color of the shores, which, if red, denotes you are to the eastward, and if white, to the westward of it. S. by E., distant 2 full miles from the light-house, lies the Henercy Rock, with only 8 feet water over it; and E. N. E., distant one mile from the Henercy, lies the Lockwood, of 12 feet; these appear to be but little known, although they are both so very dangerous.

THE LEDGES.—About two miles to the westward are the Western Ledges; these are the Bull, the Horses, and the S. W., or Outer Rock; the Bull is the westernmost and nearest to the land; this is a rock above water, lying about two-thirds of a mile S. E. by E. from Pendant Point, the light-house bearing from it E. 7° S. The Horses are about a mile to the south-eastward of the Bull, the light-house bearing E. by N., distant one mile and three-quarters; and the S. W. Rock or Ledge lies with the light-house bearing E. by N., distant one mile and a half; to avoid these, constant caution will be requisite, though they are surrounded by deep water; the channel between the Bull and the main having 10 fathoms water, and the passage clear: between the Horses and the Bull are 16 fathoms, and no intermediate danger; and between the Horses and the S. W. Rock there are 20 fathoms.

The Eastern Ledges are the Sisters, or Black Rocks; these lie nearly E. by S. from

the light-house, distant two-thirds of a mile. There is also the Bell Rock, lying further in, and about a quarter of a mile from the land, the extremity of Chebucto Head bearing N. by E. ½ E., distant three-quarters of a mile. In advancing up the harbor, you will meet with several other rocks, as the Rock Head, which lies with Chebucto Head, S.W. by W., distant 2½ miles, and the Devil's Island N. E. ½ E. about the same distance; the Thrum Cap, which extends from the south end of Mac Nab's, or Cornwallis' Island; the Lichfield, on the western side of the harbor, having only 16 feet water over it; and the Mars Rock, lying also on the western side, Point Sandwich bearing N., distant half a mile, and nearly in a line with it and the west side of George's Island; all these are distinguished by buoys and flags being placed upon them. There is also a reef, called the Horse Shoe, which runs out from Mauger's Beach, on the west side of Mac Nab's Island; this is dangerous and must carefully be avoided. On Mauger's Beach is a tower, called Sherbrook Tower, on which is a light-house, elevated 58 feet above the level of the sea, erected for the purpose of guiding vessels up the harbor.

When abreast of Chebucto Head, or when Sambro Light bears W. S. W., the light on Mauger's Beach should never be brought to the westward of N. By keeping the light from N. to N. by E. will lead clear of the Thrum Cap Shoal. This light-house bears from the Thrum Cap Buoy N. ½ W. two miles and a half.

Directions for Sherbrook Tower Light-house.

Vessels coming from the eastward must keep Sambro Light open to the southward of Chebucto Head, until the light opens on Mauger's Beach, which will then bear N. ½ W., when they will be to the westward of Thrum Cap Shoals, and may shape a course up the harbor, always keeping the light on the beach open, and on the starboard bow.

Vessels coming from the westward will see the light when they are as far to the eastward as Chebucto Head; by keeping it open and on the starboard bow, it will lead them up to the beach.

The light on Sherbrook Tower appears of a red color, which distinguishes it from any other on the coast.

High water, Halifax Dock Yard, 8 o'clock; spring tides rise from 6½ to 9 feet. High water at Sambro Isle 8h. 15m.; spring tides rise from 5 to 7 feet.

Half way between Mauger's Beach and George's Island is a shoal, on the opposite side, extending to the S. E. from Point Pleasant nearly one-third of the channel over, and having a buoy at its extremity; the thwart mark for this buoy is a little islet at the entrance of the N. W. arm on with a remarkable stone upon the hill, appearing like a coach box, and bearing W. S. W. Between Point Pleasant Shoal and Mauger's Beach, is a middle ground of 4½ and 5 fathoms, sometimes pointed out by a buoy: this middle ground extends north and south a cable's length, and is about 30 fathoms broad; as you fall off to the eastward of it there will be found from 7 to 13 fathoms water, muddy bottom; while on the west side there are from 10 to 14 fathoms, coarse rocky soundings.

REID'S ROCK has 12 feet water over it, and lies in shore, about mid-way between Point Pleasant and Halifax; the thwart mark for this danger is a farm house in the wood, over a black rock on the shore, bearing W. by S., and opposite to Reid's Rock is a buoy on a spit extending from the N. W. end of Mac Nab's Island.

MAC NAB'S ISLAND lies on the eastern side of the channel, and is nearly three miles in length and one in breadth; there is a small island to the eastward of it, called Carroll's Island; boats can pass this way, or between it and the Devil's Island shore, in what is commonly called the S. E. Passage, but the channel is too shallow for shipping, and it is further obstructed by a bar of sand to the southward, over which are only 8 feet water. Mac Nab's Cove has good anchorage in from 9 to 4 fathoms, muddy ground; the best situation is in 7 fathoms, with Mauger's Beach and Sandwich Point locked; George's Tower touching Ive's Point.

Dartmouth is a settlement on the eastern side of the harbor, opposite Halifax.

To sail for Halifax Harbor.—Having made the light-house, and coming from the westward at night, with a westerly wind, the light being 7 or 8 miles off, steer E. N. E., or E. by N., until you have passed the S. W. Ledges, and the light-house bears N., then run on N. E., or N. E. by N., until you bring it to bear N. W., which being done, take a N. N. E., or N. E. by N. course, until you bring it W. N. W.; you will then, agreeably to the wind, haul up N., or N. by E., for Chebucto Head, avoiding the Bell Rock. Chebucto Head is bold to within half a mile from the shore; run on north, along the west shore, for Sandwich Point, which also is bold: thus you will safely pass the Lichfield Rock, leaving it on your larboard side; this rock has a buoy placed on its eastern end, a mile northward of which is the Mars Rock, whose situation is pointed out by another buoy, which must also be left to the larboard. When abreast of Sandwich Point, get as near Middle Channel as you can, for on the opposite side is the Horse Shoe, a dangerous shelf, which stretches out from Mauger's Beach; steer on mid-channel between Mauger's Beach and the Horse Shoe, and, having passed the latter, edge over towards Mac Nab's Island. Midway between the Island and Point Pleasant Shoals, on the extremity of

which is a buoy, and rather more than half a mile further, on the same side, is Reid's Rock, whose position is also denoted by another buoy: these are all to be left on the larboard side. On the starboard, or opposite side, is a red buoy placed upon the spit whch runs off Mac Nab's Island; you will sail on between these two latter buoys, and having passed the reef, steer directly north for George's Island, which you may pass on either side, and run up for, and abreast of, the town of Halifax, where you will find anchorage in 9 and 10 fathoms, muddy ground, two cables' length east of the mooring buoys, or near enough to the wharves to throw your hawser on shore. There is a middle ground between Mauger's Beach and Point Pleasant Shoal, which sometimes has a buoy upon it, but no less than 5 fathoms has yet been found upon it.

"The great difficulty of making Halifax from the eastward, particularly in the winter season, is that the winds are generally from the W. S. W. to N. W., and blow so hard as to reduce a ship to very low canvass, if not to bare poles: but should the wind come to the eastward, it is invariably attended with such thick weather as to prevent an observation, or seeing any great distance; and consequently renders it imprudent to run on a lee shore under such circumstances, and more particularly in the winter time, when the easterly winds are attended with sleet and snow, which lodge about the masts, sails, rigging, and every part of the ship, becoming a solid body of ice so soon as the wind shifts round to the N. W., which it does suddenly from the eastward. What adds considerably to the above difficulty is, having been several days without an observation, and subject to a current, which sometimes runs strong to the southward, you may have the Bay of Fundy open, and be swept into it by the strong indraught which prevails when the wind has been any time from the southward or eastward.

"From the above circumstances, I would recommend that ships bound to Halifax in the winter, should shape a southerly course, and run down their longitude in latitude from 38° to 36°, in which parallel they will make the principal part of their passage in a temperate climate, until they approach the coast of America, when they will be met by the westerly, or even north-west winds, which will enable them (having got soundings, on St. George's Bank,) to make their course good along shore, and with a free wind and clear weather, cross the Bay of Fundy, with confidence of their situation; then, so soon as they have shut in the bay, keep the shore on board the whole way to Halifax light-house."

Observe, in coming from the eastward with an easterly wind, the Thrum Cap Shoals must be particularly avoided; a red buoy, as before noticed, now marks their extremity, and to go clear of them, you should bring the easternmost land in sight a ship's length to the southward of Devil's Island, bearing E. N. E. nearly, and steer in W., or W. by S., as best suits the distance you are from the island, and according to the wind and situation: with respect to the shoals, you may pursue a West, N. W., or W. N. W. course, until George's Island comes a sail's breadth open to the westward of Mac Nab's Island; then stand up for Sandwich Point, or the fort, until St. Paul's steeple, in Halifax, is open of Brenton House; keep this mark on, and you will go in the fairway, clearing Point Pleasant Shoals and Mauger's Beach; then steer on as before directed.

The long mark for Halifax Harbor, from abreast of Chebucto Head, and steering in N., or N. ½ W., is the middle of three hills, over Dartmouth village, having some trees upon it, in a line with the N. W. end of George's Island; this will lead clear of the dangers on both sides, and over the Middle Ground, in from 5 to 8 fathoms, and up to George's Island.

The marks for the Lichfield Rock are the channel between the Devil's Island and the main open, bearing E. N. E., and George's Island open to the eastward of Sandwich Point; over this rock are only 16 feet.

The marks for the buoy at the extremity of Point Pleasant Spit, is a small island at the entrance of the N. W. arm, on with the stone on the hill, bearing W. S. W. The marks which clear Point Pleasant Shoals will also clear the Reid Rock; its thwart mark is a farm house in the wood over a black rock on the shore, bearing W. by S.

In approaching from the westward, round the light-house, at the distance of a short league. To avoid the sunken rocks which lie to the southward, when the light bears N. W. by N., haul in N. by W. The flag-staves on the Citadel Hill above the town are distinguishable at a considerable distance; by keeping them open of Sandwich Point, you are led clear of the Bell, Lichfield, and Mars Rocks, on the west side, and the Rock Head and Thrum Cap to the east. When arrived at Sandwich Point, keep Chebucto Head in sight, by not allowing it to be shut in; this plain mark will lead in the fairway home to George's Island; leaving Point Pleasant Shoals on the left, and Mac Nab's Shoals on the right, round George's Island on either side, and anchor any where in 6, 10, or 13 fathoms, muddy ground; from George's Island to the entrance of Sackville River, there is not a single obstruction. Men-of-war commonly anchor off the naval yard, which a stranger will distinguish by the masting sheers; merchant vessels discharge their cargoes, and load alongside the wharves.

Catch Harbor, fit only for small vessels, lies to the westward of Chebucto Head; it has

a bar across with breakers, and only 9 feet water; within it are 3 and 3½ fathoms; there is a fine run of fresh water at the head of the harbor. Herring Cove is about 100 fathoms wide at the entrance, and bold on both sides, with 7, 5, and 4 fathoms up to the elbow that forms the Inner Cove, within which small vessels lie perfectly sheltered in 7 and 9 feet, soft mud, the sides being one entire body of rock.

REMARKS.—Leaving Halifax, and sailing westward, you will find the shores to be steep, and appear from seaward broken and rocky, with whitish cliffs; the high lands of Aspotogon and Le Have, before mentioned, are conspicuous and remarkable; to the westward the rocks about the land appear black, with reddish banks of earth. Le Have appears bald or barren at the top, with red earthy hillocks under it, and between Cape Le Have and Port Medway, or Jackson, are some hummocks inland, the coast to the seaward being level and low, and the shores marked with white rocks, with low barren points; from thence to Shelburne and Roseway it is woody. Near Port Latour are several barren places, and thence to Cape Sable the land is low, with white sandy cliffs, particularly visible at sea.

SAMBRO HARBOR is a mile and three-quarters N. N. W. from the light-house; off its entrance is the Bull Rock; there are also two other rocks between; the best channel into the harbor is between Pennant Point and the Bull, but vessels from the eastward may run up between Sambro Island and the Inner Rock; you are to leave the Isle of Man to the larboard in entering; the anchorage is within the island, on a muddy bottom, with 3 fathoms water.

The strait which connects the harbor with Londy Basin is exceeding narrow, and has only 2 fathoms water. This place is generally the resort of coasters in bad weather.

The passage between the rocks and ledges that lie to the southward of Sambro Harbor, may oftentimes conduce to the safety of vessels, that make the land by mistake so far to the westward of the light as to be unable to clear the dangers southward of it, but should be attempted only in cases of emergency; the depth of water is sufficient for the largest ships, but great prudence is required.

TENNANT HARBOR is situated round the point to the westward of Port Sambro, has a fair channel leading in between Tennant Great Head and Island, with good and secure anchorage, particularly above the islands, in 6 or 8 fathoms; it is extensive and safe in bad weather, and the dangers are all visible.

TENNANT'S BAY is well sheltered above Macworth Point, and there is anchorage in 9 fathoms, on a bottom of tough blue clay; the passage in lies between the rocks of Point Macworth and the white rocks. There is also a safe passage between Cape Tennant and Hervey Island, with anchorage in from 5 to 8 fathoms. When entering, the land presents to the eye of a stranger the rudest features of nature, but it is extensive and safe, and in bad weather the dangers all show themselves. The tides rise 8 feet, and it is high water at three-quarters after 7.

PROSPECT HARBOR lies about 3 miles to the N. W. of Cape Prospect, which forms the west side of Bristol Bay; and its entrance is encumbered with a cluster of islands which form the western side of Bristol Bay; at the back of these islands is a considerable inlet, called by Des Barres, Parker's River, but little frequented. Prospect Harbor wears, at its entrance, a rugged broken appearance, but it is safe, commodious, and extensive, and in rough weather the dangers mostly show themselves. Vessels coming from the eastward, and rounding Cape Prospect, must beware of a rock with 17 feet over it; it lies south about one-third of a mile from the cape; go not between it and the cape, but proceed on its southern side in 20 and 21 fathoms water, and by keeping more than half a mile from the land, you will steer quite clear of danger, and may sail boldly up its eastern channel, between Prospect and Betsey's Islands; having passed these, the channel narrows; the western passage is between Hobson's Nose and Dorman's Rock; there is good anchorage for large ships above Pyramid Island, and also for small vessels within Betsey's Island, in 4½ fathoms, blue stiff clay. At the entrance to this harbor, depths are very irregular, and there is a rock over which the sea breaks, having 3 fathoms water over it, and lying 2 cables' length to the eastward of Dorman's Rock. There are some residents on the western side of the bay.

LEITH HARBOR.—This lies about 2½ miles to the north-westward of Prospect Harbor, and here are situated the inlets called Shag and Blind Bays, both possessing excellent anchorages. At its entrance lies the Hog, a sunken rock, having 6 feet water over it, and bearing E. S. E., about one mile and a half from Taylor's Island. In fair weather the Hog Rock may readily be perceived by a constant ripple over it, and in bad weather, with an onshore wind, it will be distinguished by the breakers; there are good channels on both its sides, but the eastern one is always to be preferred on account of the ledge which extends E. S. E. about half a mile towards it from Taylor's Island.

DOVER PORT lies at the western side of the entrance to Blind Bay, and is chiefly formed by Taylor's and the adjacent islands; this is the Port Durham of former charts, and affords safe and good anchorage; the eastern passage is the best, and sailing in, you must give the reef that stretches off the east end of Taylor's Island a sufficient berth,

anchoring within the body of the largest island in 7, 8, 9, or 10 fathoms, muddy bottom. The western entrance has some sunken rocks in it, and the water is in some places but shallow.

Between the harbors of Halifax and Dover the shores are craggy, broken, and barren, steep to, iron bound, and destitute of trees; but the creeks and inlets abound with fish, and great quantities of cod, herrings, and mackerel, are caught and cured here for the markets.

MARGARET'S BAY.—The entrance to this bay is to the westward of Taylor's Island about one league; the bay itself is full 25 miles in circumference, in length 9 miles, and in breadth, from Peggy's Point to Owl's Head, about 2 miles; here are harbors capable of receiving ships of war, even against the sides of the shore, and sufficiently wide to turn in. In choosing a berth, it is usual to be guided by the direction of the wind, taking the western anchorage in S. W. gales, and the eastern one in S. E., where you lie land-locked, the bottom mud.

OWL'S HEAD is very remarkable, being round and abrupt; the lands and islands in the neighborhood are rugged and barren. The body of flood tide sets in from S. W. at the rate of one mile per hour.

Following the coast, which runs nearly 2 miles W. N. W., from Taylor's Island to East Point, there is a rock uncovered at low water, which lies near the land, having a passage between, with 4 and 5 fathoms water: the shore all the way is rugged and steep, against which the sea beats violently. N. N. W. from East Point, one mile, is Contact Point, and in the same direction 1¼ mile further, is Peggy's Point, beyond which a short mile is Shut-in Island, 200 feet high, and covered with trees; off the southern point of this island there is a shoal of 9 feet, with 6 and 7 fathoms between it and the island; and near to Peggy's Point there is another of 15 feet, with 6 fathoms to the northward of it; during southerly gales the water on the lee side of the islands becomes smooth, and the bottom holds well. Indian Harbor runs in here, and forms a place fit for small vessels, but affords no shelter, being entirely open to the sea. To the E. N. Eastward of Indian Harbor is Hagget's Cove, distant one mile, a cove or harbor of similar description. Luke's Island, Thrum Cup, Jolliman and Wedge Islands, all lie off the eastern side of Margaret's Bay, and contribute to break off the force of the sea, so that under the lee of Luke's and Jolliman's Islands, there is good anchorage at all times for ships of every description.

FRENCH COVE is easy of access, and may be considered as a natural dock, extensive, with plenty of water, and well sheltered; there is a shoal of 10 feet water lies opposite to the entrance of this cove, at the distance of two miles, but as the islands of the eastern shore are bold to, no vessel need go so far out into the bay as to approach too near this danger.

HEAD HARBOR, or DELAWARE RIVER, lies at the further end, on the northeastern extremity of the bay, and is an anchorage of most excellent description, forming so complete a place of safety that a fleet of ships might be securely moored side by side, and remain undisturbed by the most violent hurricane; the surrounding lands are high and broken; Mason's Point is in itself a good farm, well stocked with cattle, and excellently cultivated; and Moser's Islands, at its entrance, are used as sheep-folds: the land on the larboard side of the entrance to the Head Harbor is 446 feet high.

INGRAM RIVER.—To the westward of Head Harbor is Ingram River, running in to the northward of Moser's Islands; at its entrance it is one-third of a mile wide, with 7, 6, and 5 fathoms water; it then gradually decreases to its head, which is shallow and sandy. To the westward is Gaspar's Indent, open, shallow, and seldom frequented. These indents or coves have rugged points projecting southward, and it is from these places small craft are employed to take limestone, building sand, &c., the former of these being of a very superior quality. Cooper and Indian Rivers are both shallow rocky nooks, but are the resorts of salmon, and in the lakes above, trout abound in great quantities, of delicate flavor, and commonly of a deeper red than the salmon.

HUBERT'S COVE, is situated at the N. W. corner of Margaret's Bay; here at the entrance is a ridge of rocks about 100 fathoms long, and covered at high water, so that when the sea is smooth it becomes invisible; in order to avoid this danger, you have only to keep towards the western or eastern side of the harbor, for both sides are bold to; the western channel is much the wider and better of the two, and by keeping the larboard shore on board, a stranger, or a ship dismasted, or in distress, or without anchors, may turn in and find shelter, running aground with perfect safety.

Long Cove is 2½ miles to the south of Hubert's Cove, and affords good anchorage with a westerly wind. To the southward of Long Cove the coast is bold and rugged, without any danger, except a small rock of six feet water which lies close in to the land.

NORTH WEST HARBOR is about one league to the southward of Long Cove; at its entrance is Horse Island, which divides it into two channels; there is a good passage with 10 fathoms water on each side of the island, and small vessels may find anchorage behind it in from 6 to 9 fathoms, or further up, in 5, 4, or 3 fathoms. Owl's Head is an abrupt precipice, and forms the south point of entrance to North West Bay.

SOUTH WEST, or HOLDERNESS ISLAND, is a remarkably rocky island, full 50 feet high, and steep on all sides: directly to the northward of the northern part of the South West Isle is a small spot of 3 fathoms water, and to the north-westward of the island is what is commonly called the South West Harbor, formed between Owl's Head, which literally is a rocky island, separated from the main by a very narrow passage, not even navigable for boats; here are 5, 6, and 7 fathoms water, but the place is seldom frequented. To the E. N. E. of South West Island, distant nearly half a mile, is a rocky shoal of 4 fathoms; this the sea frequently breaks over, in bad weather, but it cannot be considered dangerous, unless to vessels that draw very deep water.

THE HORSE SHOE, or DOG ROCK, lies about south, distant one mile and a half from South West Island; directly west from East Point, distant 2 miles and three-quarters, and from Taylor's Island W. by N. 4 miles and one-third; there are several small sunken rocks about it; part of it is consequently above the surface of the water shelving on all sides, and the sea in stormy weather breaks violently over it; at a little distance from it, on the western side, are 6 fathoms, and on its eastern side, at a similar distance, are 8 fathoms; it then sinks into deep water: between the Horse Shoe and the South West Island there are 12, 14, 26, 34, and 30 fathoms water. Vessels from the eastward, bound for Margaret's Bay, commonly go in between the Horse Shoe and East Point; a northerly course will carry you midway between them right up to the head of the bay, without encountering any danger, except those already described.

To the westward of South West Island is Aspotogon Harbor, too shallow for shipping; at its entrance are Black, Saddle, and Gravelly Islands and Shoals; to the southward of these is Seal Ledge, shallow and dangerous; it lies W. ½ N., distant 2¾ miles, from the Horse Shoe, and W. S. W. nearly 3 miles from the southern part of South West Island.

IRONBOUND ISLAND.—W. S. W. ½ S. from the south point of South West Island, distant 5 miles, is Ironbound Island, about one mile long, narrow, and steep to; it lies S. S. E. ½ S. one mile and a half from the extremity of the peninsula which divides Margaret's and Mahone Bays, and is called New Harbor Point; between which is a good channel, with from 6 to 17 fathoms water, the ground being chiefly a black sand.

GREEN ISLAND.—S. ½ E., distant one league from Ironbound Island, S. W. by S. 7 miles from South West Island, W. S. W. 3 leagues from Taylor's Island, and W. N. W. ¾ W. from abreast of Sambro light-house, lies Green Island; it is small. Midway between Ironbound and Green Islands there is said to be a shoal of only 2 fathoms, but its exact position is not accurately known, and therefore it is omitted in the charts; the mariner, in passing through the channel between these islands, will do well to look out for and guard against the probable existence of such a danger; there is otherwise water sufficiently deep for any vessel.

MAHONE BAY is separated from Margaret's Bay by the peninsula upon which the high and conspicuous mountain of Aspotogon is situated, whose appearance, in three regular risings, is a very remarkable object to seaward, being visible more than 20 miles off; its entrance is encumbered with several islands, between all which are good passages with plenty of water, and few dangers; these lead to most excellent harbors, and places convenient and well adapted for the fisheries. We have already noticed Green and Ironbound Islands; these lie on the eastern side of the entrance to the Bay of Mahone; adjacent to these, and on the same side, are the Tancook Islands, Flat Island, and the Knohme Rock; there are also the Bull Rock, and the Outer Ledge. On the western side are the Duck and other islands.

Great Duck Island lies W. by S. from Green Island, distant 4½ miles. Little Duck Island lies N. W. ½ N. about one mile and two-thirds from Great Duck Island, and W. ½ N. 5 miles and one-third from Green Island: nearly midway between Green Island and Little Duck Island lies the Outer Ledge, over which the sea always breaks; this danger bears from the east end of the Great Duck Island N. E. ¾ N., distant one mile and two-thirds; and from Green Island W. ½ N. one league; over it is 4 feet water, and round it are 4½, 5, and 7 fathoms.

Flat Island lies due west from Ironbound Island, distant one mile and a quarter; and in a similar direction from Flat Island, somewhere about one mile off, lies the Bull Rocks, but the exact situation of this danger is not correctly ascertained, for Mr. Des Barres places it more to the southward, and Mr. Lockwood to the northward of this position; it is a blind rock, uncovered at one-third ebb, with deep water all round it. The southern part of Flat Island, in a line with the southern points of Ironbound Island, will lead on the rock, as Mr. Des Barres has placed it, while the northern part of Flat Island, in a line with the northern shore of Ironbound Island, will lead to the northward of it; and Chester Church open of Great Tancook Island, will carry you clear to the westward of it, in 7 and 10 fathoms water.

Great Tancook is one mile and three-quarters long, and about a mile broad; to the eastward, between it and the main land, is the little Tancook Island, separated by a channel a quarter of a mile broad, in which are 7, 8, and 9 fathoms; a similar passage is between Little Tancook and Indian Point on the main, but there is a middle ground in it of 4

fathoms. Knohme Rock is above water, and shoals all round; it lies to the eastward of the south-east part of Great Tancook, and at this part of the island is anchorage in 8 or 10 fathoms water.

Westward of Great Tancook, one-third of a mile, is a rocky shoal of 6 feet, while between them the channel has 10 fathoms water: to the W. by N. of this shoal, one mile, is another, with from 6 to 12 feet over it; between these shoals the passage is good, and has from 12 to 25 fathoms water in it. Off the north-west part of Great Tancook is Star Island, and a little to the eastward of it is a rocky patch of shallow ground, so that vessels should never attempt the passage between Star and Tancook Islands. There is yet another danger, called the Coachman's Ledge; it lies 2 miles to the northward of Great Tancook, and is only visible at low water; to lead clear to the eastward of this ledge, you should bring the eastern point of Great Tancook and the east side of Flat Island in one; to clear it to the southward, bring the west end of Ironbound Island open of the west part of Little Tancook: and Frederick's Island north point bearing W. S. W. ½ S., will carry you safe to the northward of it.

Having passed the Coachman, the head of the bay lies open; on your starboard side is the high land and small River of Aspotogon, where small vessels occasionally run in and anchor; there is a rocky shoal at its entrance, which must be avoided. To the northward is Cumberland Arm, easy of access, and affording good anchorage, with 7 and 8 fathoms, observing to give a berth to the starboard shore, which shallows some distance out. There is also good riding on the larboard shore, behind an island which lies on the eastern side of the Chester Peninsula; here vessels can ride, well sheltered, in 8 fathoms water.

Chester Town is situated at the northern part of Mahone Bay, and is surrounded by a fine and fertile country; its inhabitants are industrious people, and the adjacent islands are well clothed with sheep; wood and water are in abundance, and several vessels are built here; the anchorages between the various islands and before the town are good, well sheltered and secure, and the depth of water moderate; the only danger is a shoal, which partly dries at low water: this lies W. ½ S. from the Town of Chester, from which it is distant one mile and three-quarters.

On the larboard side of Mahone Bay, and directly west of Tancook Islands, is a large inlet or branch of a river, named by Des Barres, Princes Sound; the passages into it are very safe, only giving a wide berth to the southern end of Edward's Island; steer mid-channel, and, when well in, anchor in 9 fathoms, or within the innermost islands, in 5 or 6 fathoms; further in it becomes flat and shallow.

To sail into Mahone Bay from the eastward, the first land visible will commonly be Green Island, which is round, bold, and moderately high; thence to Ironbound and Flat Islands, both steep to, are two miles and three-quarters; you may proceed and pass between them towards the Tancook Islands; these are inhabited; the channels between them are bold, and the anchorages under their lee good, in from 7 to 12 fathoms water: but if you are proceeding for Chester between Green and Duck Islands, you must beware of the Outer Ledge, which always shows itself by breakers; the mark to lead clear through this passage, is Chester Church well open of Great Tancook Island; this mark will also carry you safe to the westward of the Bull Rock, already described; and when you get near, or within half a mile of Tancook Island, steer out westward, and bring the same church to bear about north, and this will lead you up to the town.

LUNENBURG BAY, called also Malaguash, is now a place of great population and considerable trade; vessels carrying wood, cattle, vegetables, &c., are constantly employed from here to Halifax; the harbor is very easy of access, and there is good anchorage to the very town. At its entrance lies Cross Island, about 30 feet high, and containing 253 acres of land, on which a light-house, painted red, is erected, containing two lights, one 30 feet above the other; the lower one is fixed, the upper one is flashing or darkened at intervals of one minute: the building is red. Crop Island is low and thickly covered with trees. On the N. E. side of this island is a nook, where coasters ride in safety; off this part lie the Hounds Rocks, which, in passing, must have a berth; the west and south sides of the island are bold; and two miles from its southern end is an excellent fishing bank, with from 14 to 17 fathoms water. There are good channels on either side of Cross Island.

Vessels sailing in or out, through the northern passage, should endeavor to keep about the middle of the channel, in order to avoid the shoals and rocks above mentioned, and also those adjacent to the opposite, or Colesworth Point: having passed these you should keep the northern shore on board, bringing Battery Point to bear nearly N. W., by which you will also go clear of the Sculpin or Cat Rock.

The Sculpin or Cat Rock, lies nearly in the middle of the bay, bearing N. E., distant three-quarters of a mile from Owen's Point; according to Des Barres, there are but three feet over this danger, but it will easily be discovered by the breakers over it at low water. Sailing through the western channel, which is to be preferred, you should endeavor to steer N. N. W. between Cross Island and Rose Point, where you will have 10 and 12

fathoms water; keep the Town of Lunenburg in sight over the low land to the eastward of Battery Point, and this will lead you clear of the rocky reefs about the Oven's Point; but beware lest you lessen your water below 7 fathoms, for the soundings about the point are very irregular; bring the Wagon Road at Lunenburg open to the westward of the Battery Point, and this will run you to the westward of the Sculpin, and between it and a rocky knoll of 4 fathoms water; having passed the Sculpin, haul up towards the northern shore, until you bring Moreau and Battery Points in one; this being the direct mark for the Sculpin Rock, steer on in the direction of the Battery Point, approaching it no nearer than a cable's length, then round Battery Point, and bring the road well open of the Moreau Point; this will run you clear into the harbor, and between the Long Rock and the shoals off Battery Point, when you may direct your course for the town, where you will find 12 and 13 feet water alongside the wharves, and near to them 20 and 24 feet, soft muddy ground, and perfectly secure.

Vessels having occasion to go to the southward of the Long Rock, which is the wider and safer passage, will observe there is a reef runs out from Woody Point, called the Shingles, which must be carefully avoided; to do this, when you have so far entered the bay as to be equi-distant between the Ovens, which are hollow cliffs, Battery and Woody Points, then edge off a little to the westward, until you bring a farm house, that stands over the middle of Sandy Bay, on with the end of a wood close to an opening like an avenue, bearing N. W. $\frac{1}{2}$ N., steer with this mark on, until the west end of Lunenburg Town comes over Moreau Point, then steer north-eastward a little, approach Battery Point, and proceed as before directed.

The best anchorage in the Bay of Malaguash or Lunenburg, is on its western side, about half a mile from the shore, and nearly midway between Oven's and Woody Points; where, with good ground tackling, you may safely ride out a south-easterly gale; but the bottom is generally rocky and uneven. It is high water, full and change, at 9 o'clock.

DARTMOUTH BAY.—This is situated between Oven and Rose Points; there are some settlements about the shores, and on an island at the bottom of the bay; it is easy of entrance, and you may anchor abreast of this island in 3, 4, 6, or 7 fathoms; in sailing into this bay, it will be always advisable to borrow somewhat towards the Rose Point shore, because of the shoals which lie to the southward of the Oven's Point; there is otherwise no danger whatever.

From Lunenburg to the Ironbound Island, at the entrance to Le Have River, the shores are bold, and much indented with irregular inlets or bays. Ironbound Island lies about W. S. W. $\frac{1}{2}$ S., distant nearly 2 leagues from Cross Island; it is inhabited, and some small rocky islets surround its northern shore: S. E. $\frac{1}{2}$ E., $1\frac{1}{2}$ mile from this island is a bank of 20 and 25 fathoms, and W. S. W., three-quarters of a mile from that, is a small spot of 15 fathoms; these have from 30 to 40 fathoms about them.

LE HAVE RIVER.—Vessels coming from the south-eastward for Le Have River, will not fail to discover Cape Le Have, a steep abrupt cliff, 107 feet high, bearing W. $\frac{3}{4}$ S., about 12 leagues distant from Sambro light-house. S. E. by S., one mile from the cape, is the Black Rock, 10 feet high, and 100 feet long, with deep water all round it, and 9 to 11 fathoms between it and the shore, except on a small knoll, lying off, and opposite to the cape, over which are only 4 fathoms; W. by S., distant $3\frac{1}{2}$ miles, is Indian Island; and to the northward of the cape lie several islands, with passages between them; but the best entrance to the River Le Have is to the northward of them all. There is also a channel to the northward of Ironbound Island, but it is narrow, and to navigate this you must give the Ironbound Island a good berth; you will then have from 12 to 4 fathoms water all through it; but the best passage is to the westward of the island, which is above one mile and a half broad, and has from 10 to 14 fathoms water within it; about 3 miles to the north-westward of Ironbound Island, is a bar which runs across, from shore to shore; over this are 12 and 15 feet, the deepest water being one-third across from the eastern shore: the soundings from Ironbound Island towards the bar are 11, 14, 12, 9, 7, 6, 5, 4, and 3 fathoms, the latter depth being close to the edge of the bar; but when you are well over that, you drop into 4, 5, and 6 fathoms, the river continuing navigable 12 miles up, or so far as the falls: the general width of the river is half a mile, and when you are 8 miles up it, you will meet with the road from Lunenburg to Liverpool, where a ferry is established.

Within and to the westward of Cape Le Have is Palmerston Bay, at the head of this is Petit Riviere; off the eastern entrance of this bay lies Indian Island, bearing W. by S., distant $3\frac{1}{2}$ miles from Cape Le Have.

PORT METWAY lies between Cape Le Have and Liverpool Bay; and is a place now rising into considerable consequence, on account of its navigable capacity, and its convenience to the fisheries. The entrance to this port bears from Indian Island W. S. W., distant 7 miles, the land to the eastward of it being remarkably broken and hilly; on the starboard point of the entrance lies Frying Pan Island, which is connected, by a sandy reef, to numerous islets which stretch along in a N. N. E. $\frac{1}{2}$ Northerly direction, until they join the main land; that which is next to Frying Pan Island is commonly called

Glover's Island, and lies half a mile to the northward, and bears S. E. ½ S. a good mile and a half from Metway Head. The entrance to this port may be known by the high land at Cape Metway, and the low ragged islands before mentioned; the width of the channel is about seven-eighths of a mile, and the depth of water from 5 to 14 fathoms. Directly in the way of your making for the entrance of the channel, lies the South West Ledge and the Stone Horse Rock; the former bears from the Frying Pan Island S. ½ E., distant ¾ of a mile; there are 19 feet water upon it, and the sea, in rough weather, breaks over it: the latter, or Stone Horse Rock, lies E. by S., distant one-third of a mile from the S. W. Breaker, and dries at low water: there are 6, 7, and 8 fathoms between it and the Frying Pan Ledge, and should you pass this way, you must give the island a good berth, on account of a spit which runs out from it, in the direction of the Stone Horse Rock, a full quarter of a mile: but the best course will be half a mile outside of both these dangers, you will then pass in 12 and 14 fathoms water, and running on W. a little southerly, toward Kempenfelt Head, you will open the channel, and may steer in directly north. Or, you will avoid the S. W. Ledge and Stone Horse Rocks, in coming from the eastward, by bringing the Liverpool light-house, which stands on Coffin Island, open of the land to the eastward of it: and when Frying Pan Island comes N. N. E., distant 1¾ mile, steer in N. ½ E., this will carry you past Metway Point; and when opposite to Neil's Point you may anchor in 4 or 4½ fathoms water: from hence mud banks considerably narrow the passage, and a pilot will be found necessary; but should you proceed further without one, you will continue mid-channel from abreast of Neil's Point, N. N. W. ½ N., until Collin's Island bears west, and until Alicia River is just opening of Point Lucy, then steer N. W. by N. and W. N. W. ½ W., and anchor in 3 or 4 fathoms, muddy ground.

To run up Alicia River, you must sail between Grass Island and Point Lucy, keeping close to the southern and western shores, in order to avoid the Flat which extends from the northward, leaving a deep but narrow channel. Barry Bay, or Branch, which runs up to the westward, is shallow, and full of rocky shoals; and so is Brier Bay, which is situated on the N. E. side of the port. The tide runs commonly with great strength, and it is high water at 45 minutes after seven.

At Cape Le Have it is high water, full and change, at 8 o'clock, tide rises from 5 to 7 feet.

Malaquash Bay	6 to 8
Green Island	6 to 8
Mahone Bay	7

LIVERPOOL BAY.—The entrance to this bay bears about W. by S. distant 17 or 18 leagues from Sambro light-house, Halifax; and W. S. W. ¼ W. 15 miles from Cape Le Have; before it lies Coffin's Island, which is now distinguished by a light-house, painted red and white, horizontally, 75 feet above the level of the sea; the light is on the revolving principle, and appears full at intervals of 2 minutes; between this island and the western land is the bay, affording good anchorage for large ships, especially with the wind off shore. In the bay there is sufficient room for turning to windward, and the deepest water will be found near the western coasts; the land in the vicinity of the harbor is broken, rocky, and of a barren appearance, yet the commerce of the town is very considerable. The channel to the northward of Coffin's Island is shallow, having a sandy spit running from it and joining the main land; therefore none but small vessels ever attempt it; but the passage to the southward is full one mile and a half wide, and has 15, 16, 17, and 18 fathoms water. Give the light-house point of the island a small berth, as a flat of 3 and 4 fathoms encompasses it, and there is no other danger. Bald Point, or Western Head, is bold to, and rendered remarkable by its having no trees upon it. Having entered this bay, and passed between Coffin's Island and Moose Head, bringing the light-house to bear E. by N., distant 1¼ mile, steer west; this will bring you abreast of Herring, or Schooner's Cove, situated on the N. E. side of the bay, and affording good shelter from sea-winds in 3 fathoms water, on a bottom of mud; or, proceeding further, vessels of two or three hundred tons, with high water, may pass over the bar, which stretches from Fort Point to the opposite shore; but at low water this cannot be done, for then it has not more than 9 or 10 feet over it; when within the bar you will perceive the channel winds S. Westerly, and you can anchor in not less than 2 fathoms, opposite the Town of Liverpool. Herring Bay is much exposed to the heavy S. Easterly swells of the sea, and has not room for more than two sloops of war.

It is high water in Liverpool Bay, full and change, at 50 minutes after 7, and the tides rise from 5 to 8 feet

PORT MATOON, or MOUTON, called by Des Barres, Gambier Harbor.—This port is formed by the Island Matoon, which lies across its entrances, dividing it into two channels. In the eastern passage lies the rocky ledge, called the Portsmouth, or Black Rocks, partly dry: this is about one mile to the eastward of the island, and lies S. W. by W. distant 5 miles from Bald Point; the passage on either side of the ledge has deep water, with sufficient room to turn into the harbor. From the N. W. part of Mouton a

shoal runs off a full mile, having $2\frac{1}{4}$ fathoms near its outer extremity; over some parts of this shoal you will have 3, $3\frac{1}{2}$, and 4 fathoms; here also is a small spot of foul ground, with 20 feet over it; this lies N. N. W. $\frac{1}{4}$ W. from the N. W. end of Mouton Island, and N. E. $\frac{1}{2}$ E. from the Northern Spectacles Island, distant half a mile. The Spectacles lie to the W. N. Westward of Mouton Island, and are visible as you enter the port; to the northward and westward of them are 10, 11, and 12 fathoms water, muddy and sandy ground, with good anchorage, secure from all winds. To sail into Port Mouton by the eastern channel, and with a leading wind, to the northward of the Black Rocks, you may steer in W. by N. passing at the distance of three-quarters of a mile from White Point, until you bring the Spectacle Islands to bear S. S. W. $\frac{1}{2}$ W.; this will carry you clear to the northward and westward of Mouton Island N. W. Shoal, then haul up S. W. by W. for the anchorage before mentioned. To sail in to the westward of the Black Rocks, you should steer in N. W. mid-channel, or nearly half a mile from Mouton Island; in this passage you will find from 8 to 15 fathoms water; always giving the southern part of the island a berth, on account of a sandy flat which runs off it. In adopting this channel, mariners must look out for a small knoll of 6 feet, said to lie E. N. E. $\frac{3}{4}$ E., distant one mile and a half from the southern extremity of Mouton Island; this appears to be a modern discovery.

The western passage to Port Mouton is between the island and the main, and only frequented by coasters and vessels of a small draught of water; it is encumbered with shoals, and too intricate for strangers; the channel is narrow, and close to the main land, passing between it and the Bull Rock; having passed which, you can proceed to the anchorages, either off the N. W. shore of Mouton Island, or round the Spectacles.

The land now turns S. W. $\frac{3}{4}$ W. from Point Mouton towards Port Jolie; midway is a black craggy point, with several rocks about it; S. $\frac{1}{2}$ E. distant $2\frac{1}{2}$ miles from Black Point, and S. W. 14 miles from Liverpool light-house, lies Little Hope, an island 21 feet high, and 200 fathoms long; this is a very great danger, and should have a beacon to distinguish it; round the island is a shoal ground, partly drying, and with 3 and 4 fathoms upon some parts; it lies direct E. S. E. from the eastern point of the entrance to Port Jolie, from which it is distant two good miles; between the island and point, somewhat nearer to the latter, there is said to lie a dangerous shoal, not hitherto noticed in the charts.

Port Jolie is an inlet more than 5 miles deep, but very shallow, and having scarce water enough for large boats; the lands adjacent appear barren and stony, yet have some families of fishermen settled there. Nearly south from the eastern point of Port Jolie, distant one mile, is a spot of 3 fathoms, over which the sea commonly breaks; and on the western entrance of the port are some rocky ledges, which show themselves by the breaking of the water over them; there is also a small island, lying to the S. Westward, called the Little or Lesser Hope.

PORT L'EBERT.—This is the third inlet west of Liverpool, and may readily be known by the steep and abrupt appearance of its western head; and also by Green Island, which lies to the S. Westward of its entrance; this island is somewhat remarkable, being destitute of trees. Port L'Ebert is divided from Port Jolie by a peninsula, which, at the head of the respective ports, is scarcely half a mile across. The channel in runs nearly north 6 or 7 miles; but, although small vessels may run a considerable way up, ships of larger size can only find anchorage at its entrance; the depth half a mile from the head, is from 9 to 12 feet; but at the mouth of the port are 6, 4, and 3 fathoms.

SABLE RIVER lies to the S. Westward of Port L'Ebert, distant 5 miles; at its entrance, nearly midway of the channel, is a rocky islet; this lies S. W. by W. from Green Island, distant $3\frac{1}{2}$ miles; there is a passage on either side of the rock; that to the eastward has 12, 13, and 15 fathoms water, but that to the westward is somewhat shallower; the two points of the entrance of this river are distant from each other one mile and a quarter, with from 6 to 11 fathoms; but there is a bar which renders this place totally unfit for affording shelter to any but the smallest class of vessels; it is, however, not destitute of inhabitants, some of whom are settled in a small nook close to the westward of the river, which is called the Little Harbor.

RUGGED ISLAND HARBOR lies W. by S., distant 15 miles from the Hope Island, and E. N. E. 9 miles from Shelburn Light. It seems to have been so named from its craggy and rugged appearance, and the numerous dangerous ledges and sunken rocks at its entrance. This harbor is difficult of access, and seldom resorted to, unless by the fishermen, who are familiar with its navigation; yet the anchorages are good, with $4\frac{1}{2}$ and 4 fathoms; during gales of wind, the unevenness of the ground frequently causes the sea to put on a most formidable appearance, breaking violently from side to side. Off the western head, distant about a mile, is the Gull, a bed of rocks, over which the water always breaks; but between the head and the Gull are from 6 to 8 fathoms. Vessels coming from the eastward will perceive St. Thomas's or Rugged Island, lying S. W. by W. from Green Island, distant $6\frac{3}{4}$ miles; this island, having high rocky cliffs on its eastern side, affords a good mark for the harbor. To the S. W. of Rugged Island

are some rocky ledges; the outermost of these is called the Bear Rocks, being distant from the island three-quarters of a mile; between Rugged Island and the Bear Rocks, are other dangers; and a little westward of the Bears is a sunken rock; these three latter, lying in a sort of triangular form: W. by N. from the Bear Rocks, distant one mile, is the Blow Breaker, a rock with only 4 feet over it; this appears to be the Tyger of Des Barres, by whose description it should bear south from Rugg Point, which is the eastern boundary of the harbor. To sail from the eastward for Rugged Harbor, you will see the eastern cliffs of Rugged Island bearing north, distant 1½ mile; keep a good lookout for the Blow, or Tyger Rock, and pass well to the outside of the foregoing dangers; and having cleared these, haul up N. N. W. for the islands on the left, or larboard side of the harbor: in so doing you must be careful to avoid a shoal which stretches half way over from the starboard shore, narrowing the channel very considerably, so that between the shoal and Muffatt Island, the passage is not above a quarter of a mile wide; pursuing this direction, you will readily reach the anchorage in the Northern Arm. In the best of the channel, Center Island will be just open of Muffatt Island. Small vessels may be well sheltered within Cubb Basin, which is to the northward of Muffatt Island; and vessels coming from the southward or westward will have deep water on either side of the Gull Rocks, or between the Bear and Blow Rocks. At Cape Negro and Rugged Island Harbor, it is high water, full and change, at 8 o'clock; and the rise of the tide is about 7 feet.

GREEN HARBOR.—This port is to the westward of Rugged Island Harbor, having an island on its western side of entrance, and running in full three miles; this and the River Jordan, situated still further to the westward, appear to be places where good anchorages may be obtained, but they are at present little frequented by shipping, although they have many inhabitants; they are open to southerly winds, which cause a heavy rolling sea.

SHELBURNE HARBOR, or PORT ROSEWAY, is, according to Mr. Lockwood, justly esteemed the best in all Nova Scotia, from the ease of its access, and perfect security of its anchorage. At the entrance of the harbor is the Island of Roseneath, or M'Nutts, which is nearly 3 miles in length, and 1½ in its broadest part; on the S. E. point of this island stands an excellent light-house; this point is a high cliff of white rocks, the summit of which is without trees; the west side of the island is low. The light-house is painted black and white, vertically, and has a remarkable appearance in the the day-time, on account of a dark wood that is behind it; while, at night, two lights are exhibited from it; the upper light is 125 feet above the level of the sea, and the lower about one-third from the top of the building. This light-house bears from the light-house of Sambro W. S. W., distant 30 leagues; from Cape Negro N. E. ½ N., 7 miles; from Point Beny S. W. ½ S., 2¾ miles; from the breakers southwest of Rugged Island W. N. W. ¼ W. 8 miles, and from the Jigg Rock, which has only 6 feet water over it, N. N. E. ½ E. 1¾ mile. When coming in from sea, make for the light-house, bringing it to bear N. W., or N. W. by N., then steer directly towards it; the dangers to be left to the eastward of you, are those adjacent to the Rugged Rocks already mentioned, the Bell Rock, which is always visible, appearing black and bold to, lying E. N. E. ½ E., distant 2½ miles from the light-house. In coming from the westward, you may steer for the entrance on either side of the Jigg Rock, and if for the eastward, on either side of the Bell Rock. When you get abreast of the light-house, you may sail in to the northward of M'Nutt's Island about N. W. by N., keeping nearly in mid-channel; the island's side is bold to, and the anchorage is good, in 7, 8, or 10 fathoms, the bottom mud; keep the western shore on board, for there is a shallow spot somewhere about the eastern side, between George's and Sandy Points. Sandy Point is about two miles beyond the N. W. part of M'Nutt's Island; give it a berth, for a sandy spit extends from it 300 yards. With M'Nutt's Island locked to this point, the anchorage is exceedingly good, and shipping may, with good ground tackling, ride in safety during the most violent storm. In the channel, about S. by E., distant nearly one mile from Carlton Point, lies the Adamant Rock, abreast of Durfey's House; this will easily be avoided by going into no less water than 4½ or 5 fathoms, or by keeping Petit's Island open of Surf Point. The inlet which runs up to the N. W. has several shoals in it, but the eastern shore has regular soundings, from Sandy Point upwards, and is free from danger, while in the upper part of the harbor, above Carlton Point, vessels may ride in 5, 6, or 7, fathoms, the ground holding well. We have already stated, that your course from the entrance towards Sandy Point will be about N. W. by N., and having rounded Sandy Point, you can proceed N. by W., and north, according to your wind.

In coming from the eastward of this harbor, be careful to avoid, and give a good berth to, the shoals off Rugged Island; and do not haul up for the harbor until you get the light-house to bear W. by N. ½ N., by which precaution you will go clear of every danger; or you may stop a tide at the entrance, in from 16 to 10 fathoms, sand and clay.

Shelburne affords excellent shelter for ships in distress, and is secure against any wind,

except a violent storm at S. S. W., abreast of the town; the wind from S. to E. does no harm, although from S. by W. to S. W. by S., if blowing hard for some considerable time, it will set the smaller vessels adrift at the wharves; but in the stream, as has been observed before, with good cables and anchors, no winds can injure you. Here you may be supplied with cordage, duck, spars, provisions, and water. Carpenters, pump, block, and sail makers, can be obtained, if required; and the port charges for vessels which put in for supplies only, is no more than 4d. per ton, light money, on foreign bottoms; but should you enter the custom-house, the duties become much higher. It is high water, full and change, at 8 o'clock; spring tides rise 8 feet, neaps 6, but a fresh breeze from the S. E. commonly brings on high water sooner, and causes an additional rise of 2 or 3 feet.

CAPE NEGRO HARBOR is named from Cape Negro, the eastern limit of an island which lies before its entrance; this cape is remarkably high, rocky, and barren, bearing S. W. ½ S., distant 7 miles from Shelburne light-house; this island is very low midway, and has the appearance of being two islands. There are two passages into the harbor, one to the eastward of the island, and the other to the westward of it; the former is much the better of the two, but this is rendered dangerous, on account of two sunken rocks which lie off its entrance; these are called the Gray Rocks and the Budget: the Gray Rock lies N. N. E. from the cape, distant a full mile, and is situated nearly on the starboard side of the channel; some parts of these rocks are always visible, and serve as a mark for the harbor. The Budget is a blind rock of 6 feet, lying nearly mid-channel, and only a quarter of a mile from the island, having deep water round it. In the channel to the eastward of the Budget you will have 10, 12, and 14 fathoms, and the best direction to enter the harbor, will be to steer one-third from the rocks off the eastern point, until Shelburne light-house is shut in, then you will be within the danger. There is excellent anchorage off the N. E. part of Negro Island, in from 6 to 4 fathoms, on a bottom of stiff mud. The northern part of the island presents a low shingly beach, from which a bar extends quite across to the eastern shore, over which are 15 feet at low water; above this bar it is navigable full 6 miles, having a smooth clayey bottom, with 3, 4, and 5 fathoms water.

The passage to the westward of Negro Island is somewhat intricate, encumbered with rocks and dangers, and should not be attempted except in cases of extreme emergency: in such circumstances, indecision or timidity might produce certain destruction; then the commander's post should be aloft, and if not possessing confidence himself, he should affect it. Mr. Des Barres says, "if coming from the westward, in hauling round Point Jeffery, to avoid the ledges, blind rocks, and shoals, extending easterly from the western shore, you should shape your course N. N. E. ½ N. towards the cape, giving the Savage Rocks a berth of three cables' length, until you open Davis's Island a sail's breadth off Point William; Davis's Island is the largest, and westernmost at the head of the harbor; run up in that direction, observing to keep clear of a sunken rock which lies E. S. E. from Point William, about 300 fathoms from the shore. Fishery Beach is bold to."

To sail through the north-east passage, which is not so difficult, keep Gray's Rocks on board, and steer N. W. for Point John, until you see across the isthmus in the middle of Cape Negro Island, or until Shelburne light-house is shut in, and having passed the Budget: from thence haul over to the westward, keeping along the shore about 2 cables' length from the island to avoid the shoal, which extends half the distance over from Point John towards the island; and when you have opened the small islands at the head of the bay, shape your course N. N. W. to the anchoring ground, the bottom is mud and clay; along the N. E. side of Cape Negro Island, the anchorage is good stiff clay.

The River Clyde, which descends from a chain of lakes that extends E. N. E. and W. S. W., a considerable distance in the interior, falls into the head of Negro Harbor, after a run of 28 miles.

PORT LATOUR, or HALDIMAND, is situated a little westward of Negro Harbor, being separated from it by a narrow peninsula; the extreme points which bound the entrance to the southward, are Point Jeffrey, or Blanche Point, to the eastward, and Point Baccarro to the west; between and within there are several clusters of rocks, rendering the harbor unfit for any but small craft; and the tide leaves the head of the inlet dry in many places; the adjacent lands are barren, and the settlers are but few; nevertheless, as some vessels may be driven to seek shelter here, the following directions of Mr. Des Barres may prove acceptable. "To sail into this port, coming from the westward, continue your course easterly, until you have Brehem Isle a ship's length open to the eastward of North Rocks: thence you may steer northerly for Isle George, and when you come up within the distance of two cables' length from its south end, incline to the westward in a direction with the western extremity of Pond Beach, until you open Prospect House on the north side of the northernmost Mohawk Ledges, and then haul into anchorage, in 3 fathoms, muddy bottom.

"Nearly midway between Baccarro Point and the South Ledge lies the Folly, a sun-

ken rock, within which and the western shore is a channel of 6 fathoms. The Vulture, a dangerous breaker, lies S. W. ½ S., nearly two miles from Baccarro Point."

BARRINGTON BAY.—This is a spacious inlet, situated to the westward of Port Latour, and formed by Cape Sable Island, which lies in front of its entrance; there are two passages into it; that to the eastward is between Baccarro Point and Sable Island, being at its entrance three miles wide; that to the westward is not more than a mile broad; both are encumbered with numerous and extensive flats, narrowing the passages, and rendering the navigation dangerous; for although the channels may generally be discovered, by the waters appearing dark, yet it will require a leading wind to wind through to the anchorage, which is towards the head of the bay, and about one mile and a half below the town; here there are from 18 to 26 feet water. The passage to the northward and westward is used by small vessels only, and is not safe without a commanding breeze, as the tide of ebb is forced unnaturally through to the eastward, by the Bay of Fundy tide, at the rapidity of 3, 4, and sometimes 5 knots an hour: setting immediately upon the rocks which lie within it.

The Town of Barrington is situated at the north-eastern extremity of the bay. Vessels venturing into this bay by the eastern passage, must be very careful to avoid Baccarro Point, giving it a wide berth of full 2 miles on account of the Bantan, Shot Pouch, the Vulture, and other rocks which lie off it; the Vulture Rock is very dangerous, and lies W. S. W. from Baccarro Point, distant nearly 2 miles; the Bantan bears S. S. W. from the point about a similar distance, and from the Vulture S. E. almost one mile; they are both exceedingly dangerous.

CAPE SABLE is the south-eastern extremity of a small narrow island which is separated and distinct from Cape Sable Island; it is low and woody, but the cape itself is a broken white cliff, apparently in a state of decomposition, and visible 4 or 5 leagues off; from this island spits of sand extend outward, both to the south-east and south-westward; the Eastern Ledge is called the Horse Shoe, and runs out 2½ miles S. E. by S.; the Western, or Cape Ledge, stretches to the S. W. about 3 miles. The tides, both flood and ebb, set directly across these ledges at the rate of 3 and sometimes 4 knots an hour, causing a strong break to a considerable distance, particularly when the wind is fresh; it will then often extend full 3 leagues out, shifting its direction with the tide, the flood carrying it to the westward and the ebb to the eastward, the former running a considerable time longer than the latter. This rippling, or breaking of the water, may be considered hazardous to pass through in a gale of wind, but there is not less than 8, 10, 12, and 20 fathoms, rocky ground.

It is high water at Cape Sable, full and change, at three-quarters after 7 o'clock, and the spring tides rise 12 feet, neaps 6.

BONNETTA COVE.—To the north-westward of Cape Sable is a small island, called Green Island, to the north-east of which an inlet runs in to Cape Sable Island, forming Bonnetta Cove, where good anchorage may be found in 3 fathoms water; the entrance to it is narrow, and runs in between a spit and the island; this will be too difficult for a stranger to discover, but is frequented by the coasters and fishermen.

FAVORITE COVE is situated in the Western Channel, and about the middle of Cape Sable Island; here also small vessels may run in and anchor in 2 fathoms, behind a small islet which lies mid-channel, at its entrance, affording a passage on either side, but that to the eastward is the best, and has the deeper water. With S. W. gales there is always good anchorage off the N. E. side of Cape Sable Island; but the Shag Harbor, which lies on the opposite side of the Western Channel, and bears N. N. W. from Bonnetta Cove, is full of shoals, and must not be attempted, unless you are well acquainted with it. It is here high water, full and change, at 9 o'clock, spring tides 11 feet, neaps 8 feet.

THE BRAZIL ROCK.—This is a flat rock, covering a space of 10 yards, over which are only 8 and 9 feet at low water; a tail extends 90 or 100 yards from its base, having 6 to 8 fathoms water; the tide, running strong over this, causes a ripple, and makes the rock appear larger than it really is. Southward of the rock, at the distance of about a mile, you will have 35 and 34 fathoms, then 30 and 22 as you approach nearer to it; but towards the Cape Sable shore the soundings are regular, from 19 to 15 fathoms; you will then lessen your water to 10 and 7 fathoms, when you will be at the edge of the Race-horse Shoal; to the northward of the Brazil Rock, in the direction of the Bantan Rock, you will have 16, 19, 15, 17, 16, 15, and 10 fathoms; with this latter depth you will be near the Bantan, and must tack to the westward. The exact position of this rock has been much disputed, but the place assigned to it by Mr. Des Barres appears to be nearly correct; its latitude is 43° 24′ 15″ N., and longitude 65° 22′ W.

Magnetic Bearings and distances between Halifax and Cape Sable.

From Sambro light-house to Cross Island Lunenburg,	nearly W.,	8½	leagues.
——Cape La Have,	W. ¾ S.,	12	do.
——Liverpool light-house,	W. by S.,	17½	do.
——Hope Island, near Port Jolie,	W. S. W. ¼ W.,	21	do.
——entrance of Port Shelburne,	W. S. W.,	29	do.
——Cape Negro,	W. S. W. a little westerly,	31½	do.
——Cape Sable,	W. S. W. ¼ W.,*	36	do.
——Brazil Rock,	Nearly W. S. W.,	34½	do.
Shelburne light-house to Cape Negro,	S. W. ½ S.,	7	miles.
Cape Negro to the Brazil Rock,	S. W. ¾ S.,	10	do.
Cape Sable to the Brazil Rock,	S. E. by E.,	8½	do.

THE ISLE OF SABLE AND BANKS OF NOVA SCOTIA.

On the days of the new and full moon, it is high water along the south shore of the island at half an hour after 8 o'clock, and it flows till half an hour past 10 o'clock on the north side, and till near 11 o'clock in the pond. Common spring tides rise seven feet perpendicular, and neap tides four. The flood sets in from the S. S. W. at the rate of half a mile an hour, but it alters its course and increases its velocity, near the ends of the island. At half flood it streams north, and south at half ebb, with great swiftness, across the north-east and north-west bars; it is therefore dangerous to approach without a commanding breeze. The north-east bar runs out E. N. E. about six leagues from the eastern extremity of the island, all which is very shoal, having in a few places no more than 2, 3, or 4 fathoms water, whence it continues E., and E. by S., deepening gradually to 12, 15, and 18 fathoms water, at the distance of 8 or 10 leagues, and shaping to the S. and S. E., sloping gently to 60 and 70 fathoms water. To the northward and eastward it is very steep, and, in a run of 3 miles, the water will deepen to 130 fathoms. Abreast of the body of the island, the soundings are more gradual. The shoal ground of the north-west bar extends 5 leagues to the westward, and deepens gradually to 70 fathoms water, at the distance of 20 or 25 leagues from the isle, and winds easterly and southerly, until it meets the soundings off the north-east bar. The quality of the bottom in general is very fine sand, with a few small transparent stones; to the northward, and close to the north-east bar, the sand is mixed with many black specks; but near the north-west bar, the sand has a greenish color. The north-east bar breaks, in bad weather, at the distance of 8 and 10 leagues from the island. The north-west bar breaks, in bad weather, sometimes 20 miles from the island.

Extract of a Letter from Capt. Joseph Darby, Superintendant of Sable Island, to the Editors.

"I have known the island for the last twenty-eight years, in which time the west end has decreased in length about 7 miles, although the outer breakers of the N. W. bar have the same bearing from the west end of the island that they then had, about N. W. by compass, distant about 8 miles, which clearly shows that the whole of the bank and the bar travels to the eastward. The ground is high and the water shoal outside of the breakers 7 or 8 miles in a N. W. direction. The flood tide sets across the bar to the northward and eastward very strong, and the ebb tide to the opposite point, changing alternately at half flood and half ebb. The ground to the southward and westward of the bar is very regular, deepening very slowly to a considerable distance; but to the northward and eastward the ground is very steep, and from the breakers, or from very shoal ground outside of the breakers, you fall into deep water all at once. The bank to the N. W. is very uneven, and curves round to the northward in a steep ridge, and at the distance of about 35 miles from the island, in a N. W. direction, are 10 fathoms water, and W. N. W. and E. S. E. from that the ground falls very suddenly into deep water. This ridge joins the middle ground, and extends in an easterly and a N. E. direction to a considerable distance, with shoal water; the bottom in small ridges, with 11, 12, 11, 13 fathoms of water, and so on, over it; and between this bank and the bar, or the island, the water is very deep, 80 or 90 fathoms. The bank extends to the eastward abreast of the island, the southernmost edge of the bank, from 20 to 25 miles to the northward of the island.

"The east end has altered very little since my knowledge of it, except in height, which is much greater than it was, and the whole island seems to increase in height every year,

* This course cannot be sailed, upon account of the intervention of the land.

but grows narrower. There is a low bar of dry sand running from the high land of the east end, in a N. E. direction, about three miles, from whence shoal water, that always breaks, extends about two miles further, in an E. N. E. direction, outside of which, for a distance of about six miles, is a passage across the bar, with from 2½ to 3 fathoms of water in it. Outside of that, again, is a piece of high ground that always breaks, and is sometimes dry, and extends in an E. N. E. direction between 2 and 3 miles, from which the shoal ground continues in the same direction some miles further. The flood tide across this bar sets very strong to the northward, and the ebb tide in the opposite direction, but not so strong. The soundings to the southward and eastward of the bar are flat and regular for a considerable distance, but to the northward and westward the ground is very steep—close to the breakers 10 fathoms, and goes down suddenly into 70 or 80 fathoms to 100 or upwards. I believe, in general, there is a very strong current setting to the W. S. W., between the Sable Bank and the Gulf of Mexico stream; and there is a strong current sets down the western side of the Gulf of St. Lawrence stream, in a S. S. W. direction. The current along the south side of the island is very shoal water, runs both east and west, and is principally influenced by the winds. The most of the wrecks that happen here are in error in their longitude; for instance, vessels bound to the eastward think themselves past the island when they get on shore upon it, and vessels bound to the westward (say from Europe) do not think themselves so far to the westward when they get on shore upon it. I have known several cases of vessels from Europe that have not made an error in their longitude exceeding half a degree, until they came to the Banks of Newfoundland, and from that here, in moderate weather and light winds, have made errors of from sixty to a hundred miles, which, I think, goes so far to prove the existence of a westerly and southerly current between the Grand Banks and here, and also of the existence of a westerly current between the Sable Bank and Gulf of Mexico stream, which will be stronger or weaker according to the distance between the the stream and the banks.

"When a casualty has occurred, and you find that you are on the body of the island, I would recommend that nothing of masts or rigging be cut away, without the vessel should be very tender, and then you may do it to ease her a little; but a vessel of ordinary strength will bear her spars until she heaves up on the beach, or settles in the sand and lays quiet, as lives and property have often been saved by a vessel having her spars standing, as from the heads of which you may often send a line on shore when it is not possible to work a boat; and by sending a good hawser after it and securing it well on shore, a chair or other more efficient article may be rigged for conveying passengers, or others, or valuable property, over the breakers in safety; as from the nature of the soft sandy bottom a vessel will not go to pieces as soon as if she was on rocks, and by the rigging being left standing, it may afterwards be saved, whereas, if the masts are cut away, the whole of the rigging goes with them, and all get tangled and buried in the sand, and are generally totally lost. But if you are on either of the bars, the first consideration should be to secure the boats and lighten the ship, and leave her as soon as ever you have to abandon the hope of getting her off; endeavor to get to the leeward of the breakers, and land on the island, according to circumstances, endeavoring to land on the north side if possible, as vessels that get on the bars very soon disappear altogether, either by going to pieces in the irregular sea and strong currents, or by rolling over the steep bank to the northward, and sinking in deep water. When property can be saved on the island, it is proper for the master and his crew to do the utmost in their power to save it; they can get the assistance of the people of the island, with a boat and teams of horses, not for hire, for they are employed by government, and the island draws a salvage of whatever may be saved on it, which is apportioned by the magistrates at Halifax: the more there is saved by the master and crew the less salvage will be taken; but it is very often the case that the crews will not assist to save property, and whatever is saved is done exclusively by the establishment, in which case the salvage is pretty high. There are buildings on the island for the shelter of persons cast away on it, with provisions for those who save none; also some buildings for the reception of perishable goods. These buildings, and whatever is put into them, are under the charge of the superintendant. All property saved must be sent to Halifax by the first opportunity: the master can keep inventories and continue with the goods if he likes, but has no control over their destination; but I believe, by petitioning the governor at Halifax, he might get permission to take them where he pleases, on paying the duty and salvage. When any property is saved on the island it is sent to Halifax, where it is advertised and sold by order of the commissioners, and the proceeds paid into their hands, out of which they pay the king's dues, the salvage apportioned by the magistrates, the expenses of freight, and other small charges, and the residue is paid over to the master, or other authorised agent, for the benefit of the underwriters and all concerned. The superintendant is under the control of the governor and the commissioners, and can take no new step without orders from them. The above and before mentioned custom is an old and long established rule, and supported by many acts of the Provincial Legislature, and more particularly

by an act passed the 4th day of April, 1836, and in the sixth year of his Majesty's reign' which does more fully explain and set forth the rules for the guidance of the establishment.

"The north side is very safe, as a vessel may approach any part of it within a mile, and vessels in distress might, by standing in on the north side and near the west end, where the principal establishment is, get a supply of fresh water or fuel, or a partial supply of provisions and fresh meat, except in cases of a strong breeze and in heavy sea on shore. There is no difficulty in working boats on this side of the island. The south side is also very safe to approach in clear weather, but from the heavy sea that constantly breaks on it, the communication with a vessel by boats, is extremely difficult, except after a spell of northwardly winds for three or four days, when the sea becomes smooth, and boats may work."

As when a vessel is on shore in a fog, it is of the utmost importance to ascertain her true position, in order to save the ship or the lives of those on board, the following directions should be attended to:

If breakers are seen to extend in a direction N. W. and S. E., you are on the N. W. bar.

If breakers are seen to extend W. S. W. and E. N. E., you are on the N. E. bar.

If breakers are seen to the northward ahead, and extending from east to west, you are on the south side of the island.

If breakers are seen to the southward ahead, and extending from east to west, you are on the north side of the island.

The eastern end of this island is in 43° 59′ N. latitude, longitude 59° 48′ W.: the western end is in 43° 57′ N. lat., long. 60° 14′ W.

ICE.—H. M. packet brig Express fell in with two islands of ice on Sable Island Bank, the 7th July, 1836, in 45 fathoms water, estimated heights 180 and 150 feet. Latitude 43° 13′ N., longitude 25° 17′ W. Air 46°, water 42°.

The Nova Scotia Banks extend nearly 70 leagues, in a westerly direction. From the Isle of Sable, they are from 20 to 25 leagues wide, and their inner edges are from 14 to 18 leagues off-shore. They are intersected by narrow winding channels, (the bottom of which is mud,) running N. W. and S. E. Between these banks and the shore, are several small inner banks, with deep water and muddy bottom. The water deepens regularly from the Isle of Sable, to the distance of 22 leagues, in 50 fathoms, fine gravel; thence proceeding westward, the gravel becomes coarser; continuing westward to the western extremity of the banks, the soundings are rocky, and shoalen to 18 and 15 fathoms water: Cape Sable bearing N. by W., distant 15 leagues.

The south-west extremity of Banquereau, lies seventeen leagues E. N. E., one half E., from the east end of the Isle of Sable. This bank extends E. by N. 35 leagues, and is near 8 leagues in width; its shoalest part is about 5 leagues from its eastern extremity, in 16 and 18 fathoms water, slimy sand and clams: whence it deepens regularly every way to 60 and 70 fathoms, towards the edges of the bank.

This bank is steep to; and from its soundings on the north side, you fall immediately into 90 or 100 fathoms water, black mud; and, on the south side, into 120 fathoms.

REMARKS.—It may be observed, generally, that the soundings all along the Nova Scotian Coast, between Cape Canso on the E. N. E., and Cape Sable to the W. S. W., are very irregular; from 25 to 40 and 50 fathoms; therefore, in foggy weather, do not stand nearer in shore than 35 fathoms, lest you fall upon some of the ledges. By no means make too bold with the shore in such weather, unless you are sure of the part of the coast you are on; for you may, otherwise, when bound for Halifax, fall unexpectedly into Mahone or Mecklenburg Bays, and thus be caught and endangered by a S. E. wind.

The weather on the coast is frequently foggy in the spring and some part of the summer; in particular at the distance of 4 or 5 leagues from the shores; but on approaching nearer, the weather is found more clear; and with the wind from the land, it is perfectly clear and pleasant.

THE WEST AND NORTHERN COASTS OF NOVA SCOTIA, AND THE COAST OF NEW BRUNSWICK, INCLUDING THE BAY OF FUNDY, WITH MANAN ISLANDS, &c.

REMARKS.—Whoever examines and well considers the situation of the south-western coast of Nova Scotia, the Bay of Fundy, and Manan Islands, will readily perceive the dangers attendant upon the navigation of its harbors, its natural exposure to the Atlantic Ocean, the variableness of its tides and winds, and the many rocks with which it is

environed. These, therefore, must be expected to involve the mariner in occasional difficulties, which will call forth his utmost energies, and require no common share of attention to surmount; yet, although the loss of vessels in these parts fully justify a perilous apprehension, there are few obstacles which a moderate exercise of skill and resolution would not have been able to overcome; and we fear it is more to the want of these qualifications in the navigators, than to the dangers of the navigation, that such losses have ever occurred.

"It is essential," says Mr. Lockwood, "to the safety of those who are navigating the Bay of Fundy, that it should be clearly understood;" and, in cases of necessity, many are the places of safety to which vessels might resort, even without the advantage of a pilot, although no man would attempt to justify the economy of saving the expense of pilotage, on a coast like this, where currents, fogs, and changes of weather may confound the best judgment.

In order to lessen these accidents, if not totally to prevent such fatal occurrences in future, let the mariner be fully convinced of the necessity of frequently sounding with the deepsea lead, and see the expediency of having his anchors and cables fit for immediate use; this cannot be too strongly impressed upon his mind, for vessels well equipped and perfect in gear, with their anchors stowed as in the middle of the Atlantic Ocean, have been here wrecked, in moderate weather, and so frequently, that such gross neglect cannot be too much reprobated; such serious losses will, we trust, be hereafter prevented, more especially as it is so dependant upon the mariner himself, and may be, in most cases, remedied by only sounding in time, and keeping the lead in continual action.

TIDES.—Another subject most particularly essential to the mariner, is a knowledge of the tides; this we recommend seriously to his attention.

CAPE SABLE TO BRIER'S ISLAND, ON WHICH IS A LIGHT-HOUSE.

THE COASTS, ISLANDS, &c.—Before we give a description of the main land, from Cape Sable to the entrance of the Bay of Fundy, it may be proper to notice the islands and rocks which lie adjacent and to the westward of Cape Sable; these are the Blonde Rock, the Seal, (on which is a light-house, painted white, containing a fixed light,) and Mud Islands, the Tusket Islands, the Gannet Rock, and Green Island, &c. The Seal Islands' southernmost point bears from Cape Sable nearly W. N. W. ¼ W., distant 16 miles, being somewhat more than two miles in length from north to south. Its southern part is covered with scrubby trees, elevated about thirty feet above the sea; to the southward of this part, distant two miles and seven-tenths, is a rock uncovered at low water, called the Blonde, from a vessel that in 1777 was wrecked upon it; round this rock are 7, 9, and 10 fathoms water. About a mile to the westward of the Blonde, are very heavy and dangerous overfalls, having a very alarming appearance. The ship Waterloo, in passing between the Blonde Rock and Seal Island, struck twice upon a rocky shoal, with only 18 feet water over it, and thereby knocked off her rudder; this was supposed to be a part of the ledge which runs off to the southward of the Seal Island. The Blonde Rock is particularly dangerous, as the ebb tide sets so strongly towards it, and from the lowness of the Seal Islands you are so likely to be deceived, even in fine weather. The tide also runs with great rapidity past the Seal and Mud Islands, which occasions the sea to break over the shoals in their vicinity, making them appear more extensive than perhaps they really are. In sailing, therefore, between the Seal Island and the Mud Islands, large vessels should always keep one mile off the latter, by which they will avoid the overfalls in 3 fathoms. Off the western part of the Seal Island, distant one mile, lie two small rocky islets, called the Devil's Limb, and the Limb's Limb; the Devil's Limb is visible at all times, and the Limb's Limb is only seen at half tide. The smoothest anchorage is midway between these and Seal Island, in 3½ or 4 fathoms, clear sand; wild fowl and fish are here in abundance. The fishermen resort to this island for wood and water; the former they obtain from wrecks, the latter from a pond near the centre of the island.

The Mud Islands, called also the North Seals, are 5 or 6 low ragged islands, the largest of which lies N. E. by N. 3¼ miles from the southern Seal Island; it is one mile and a quarter long, and off its southern point lies the Noddy, a little low islet, to the southward of which are overfalls of 18 feet; large vessels, in passing between Seal and Mud Islands, should be careful to borrow within a mile of Seal Island, for these overfalls extend full three-quarters of a mile from Noddy Islet. To this islet the petrels, or Mother Cary's chickens, annually resort in great quantities to hatch their young, flitting about in astonishing numbers. Nearly N. W. by N., distant two miles, from the largest Mud Island, is a ridge of rocks, called the Soldier's Ledge; it is commonly uncovered at half ebb. The course from abreast of Cape Sable, to pass between Seal and Mud Islands, is N. W. by W.; you will meet with some overfalls in this direction, but no danger.

Tusket Bald Islands are a cluster of islands lying to the northward of the Mud Islands, and to the south-westward of the entrance of the Tusket River; some of them are of

considerable dimensions, and there are many shoals and dangers among them, so that, although there may be navigable channels between, no stranger should attempt these passages. In the channel which separates the Tusket and Mud Islands is a rocky shoal, called by Des Barres the Acteon; it lies N. N. W., distant 4 miles, from the largest Mud Island, but Mr. Lockwood places it one mile and a half further off; nevertheless, these are generally supposed to be the same dangerous shoal, although its position does not seem to have been exactly determined; it appears to have from 2 to 4 fathoms over it, and therefore must be carefully watched for and guarded against by those who should venture through this channel.

TUSKET RIVER runs in to the north-eastward of the Tusket Islands, and is one of several inlets that are navigable on this part of the coast; it has several settlements on its banks, but at present is little known or frequented.

PUBNICO HARBOR is, according to Mr. Lockwood's account, "an excellent ship harbor, easy of access, and well situated for vessels bound for the Bay of Fundy, and distressed for either shelter or supplies. Its entrance is distant from the south end of Seal Island 12 or 13 miles, from which it bears N. E. ½ E., the depths of water between them being from 16 to 20 fathoms, and from thence to 12 and 7 fathoms up so far as the beach, which is the proper place for strangers to anchor. Above this beach, on the western side, is a ledge, which becomes partly dry at low water. About 2 or 3 miles, on the starboard shore, before you arrive at the entrance to Pubnico, is St. John's Island, under the northern side of which is good shelter in south-easterly gales; and small vessels frequently lie round the beach which forms its eastern part; but coasters commonly pass through the inner channel, within St. John's Mutton, and Bonne Portage Islands, by Cockewit, and thence towards Barrington Bay by Shag Harbor; but these places are partly shoal, and totally unfitted for large vessels.

From the entrance to Pubnico a W. N. W. ½ W. course for 4 leagues, will lead clear to the southward of the Tusket Islands, but in this route you must be very careful to avoid the Soldier's Ledge and the Acteon, both of which have been already described. Having passed to the westward of the Mud and Tusket Islands, you will encounter, in your passage to the northward, the Gannet Rock, which lies N. W. by W. nearly 6 miles distant from the Southern Bald Island, and S. ½ W. 10 miles from Cape Fourchu; it is 36 feet above the surface of the water, and always appears whitened by the dung of birds; about two miles to the south-westward of the Gannet is the Oppossum's Ledge, which is visible at half tide, and appears to have endangered the lives of many, having been formerly represented to lie 4 miles W. by N. from the Gannet; Des Barres has placed this danger in latitude 43° 40′ 40″, and longitude 66° 9′.

GREEN ISLAND lies N. N. E. ¾ N., distant 3¼ miles from the Gannet Rock light; there is a reef runs out from this island to the south-westward almost ¾ of a mile; round this reef are 6 and 5 fathoms water, and between it and the Gannet Rock from 12 to 17 fathoms. West of Green Island, about 1½ mile, is also a sunken ledge; it lies directly in the fairway of the channel to the Little Harbor of Jebogue, which is shoal and intricate, being the common resort of fishermen and coasters; the lands adjacent are moderately high, and are both well cultivated and settled. Should a stranger venture for this harbor, he must not only avoid the dangers already described, but also a rocky shoal, called the Dragon, which is situated S. W. Southerly a full mile from Jebogue Head, and N. N. E. one mile and three-quarters from Green Island; there are 8, 10, and 12 fathoms between the Dragon and Green Island, and 5, 6, and 7 fathoms between it and Jebogue Head; there is also a knoll of 3 fathoms at the entrance of the harbor, and shoal water off its eastern side.

CAPE FOURCHU, or the Forked Cape, on which there is a light-house, containing a revolving light, visible one and a quarter minute, and invisible half a minute. The building is red and white, vertically, 135 feet above the level of the sea, so called from the island which forms it, having two narrow prongs running out to the southward, but the inlet formed between these must not be mistaken for Yarmouth Harbor, which lies to the eastward of them both. This cape forms a remarkable object in these parts, being rocky, high, and barren; it bears from Jebogue Head N. N. W. ¾ N., distant 4½ miles.

YARMOUTH.—Vessels intending to run for Fourchu or Yarmouth Harbor, will find it the safest way to proceed to the westward of Seal Island, the Gannet Rock, and Green Island, giving the Gannet a berth of about two miles; they will then have no danger to encounter, but from 20 to 30 fathoms water all the way. Having passed Green Island, their course towards Yarmouth Harbor will be about N. N. E. ½ N.: in this passage they will meet with the Bagshot Rock, which dries at low water, and is dangerous, running out shoal full half a mile to the southward: it bears from Cape Jebogue nearly N. W., from which it is distant almost 2½ miles, and from Cape Fourchu S. by W. almost 2¾ miles; you may pass on either side of this rock, and run on N. by E. ½ E. for the harbor's mouth; this is considered a safe but small harbor; the fairway is to follow the eastern shore until you reach the eastern point; this you are to give a berth, and proceed mid-channel: you will readily perceive the isthmus, with a battery upon it, and

under its lee, to the northward, is the anchorage; the ground is good, and the depth of water from 5 to 6 fathoms. About a mile above the anchorage is the town of Yarmouth, which is numerously peopled, the houses large, though straggling, the grounds adjacent well cultivated, and the circumstances of the inhabitants generally good.

From Cape Fourchu to Cape Mary the main land extends N. by W., and from Cape Mary to the light-house on Brier's Island is N. N. W. 13 miles. Almost opposite to Cape Fourchu is the Lurcher's Rocky Shoal, and between that and Cape St. Mary is the Trinity Ledge, and these are the only dangers in the passage.

THE LURCHER ROCK lies nearly W. N. W. from Cape Fourchu, distant 13 miles; it covers a spot of about 3 acres of shoal ground, the least water over which is 12 feet; around the edge of the shallow water are 10, 11, and 12 fathoms, and a little further off from 20 to 30 fathoms.

THE TRINITY LEDGE comprehends a smaller space than the Lurcher, about three-fourths of an acre, having the tops of three small rocks showing themselves at low tides; this danger bears from Cape Fourchu N. by W., distant 14 miles, and from Cape St. Mary S. W. $\frac{3}{4}$ W. $6\frac{1}{4}$ miles; the depth of water to a mile round it is from 12 to 15 fathoms. The stream runs very strongly over these two dangers, but the anchorages in their vicinity are tolerably good for a tide.

Vessels coming round Cape Sable, and intending to take the Tusket Passages, may steer N. W. by N., and proceed through either of the channels which have been described before, as best suits their convenience, or else proceed to the southward of Seal Island for about 35 miles, passing at the distance of 20 miles to the westward of Seal Island; thus the Bay of Fundy will be open, and their course up N. N. W. This will carry them outside of the Lurcher, but the tide will make one point difference in this course, and it sets S. E. and N. W. through the channels of Mud and Tusket Islands, and near the Manan Ledges, the ebb running W. S. W., and the flood E. N. E., at the rate of 4 knots an hour.

From the Seal Islands up to Cape St. Mary, the soundings extend full 20 and 30 leagues off the land westward of Brier's Island light, and near the Manan Ledges are 60, 80, and 100 fathoms at 3 and 4 miles distance; therefore the lead should always be kept going.

BRIER'S ISLAND, AT THE ENTRANCE TO THE BAY OF FUNDY, TO CHIGNECTO BAY.

BRIER'S ISLAND lies at the S. W. entrance of St. Mary's Bay; it is 4 miles long and $1\frac{1}{2}$ mile broad; on its western side stands a light-house, painted white, 90 feet, containing a fixed light. In advancing from the westward towards the island, the tide ripples strongly, even in 33 and 45 fathoms, when you are at the distance of 8 or 10 miles off the island. There is a long and narrow reef runs out S. W. from the S. Eastern part of the island, full two miles, some parts of which are visible, and called the Black Rock; in the same direction to the S. W. is a small spot of 3 fathoms; this lies about $1\frac{1}{2}$ mile from the extremity of the reefs; between the knoll and reef, and also around the knoll, there are from 15 to 34 fathoms: vessels, therefore, going round to the southward of Brier's Island must always give it a wide berth. About 3 miles N. W. $\frac{1}{4}$ W. from the northern end of the island, lies the N. W. ledge of 10 feet; it is small and dangerous: nearly S. W. three-quarters of a mile from this, is Betson's Ledge, and between these two ledges and the island are two others, said also to be dangerous, with deep channels between them, but the exact situations of these are not clearly known: it will therefore be particularly dangerous for the mariner to approach nearer to the northern side of this island than four or five miles.

LONG ISLAND is separated from Brier's Island by a narrow channel, called the Grand Passage, in which are from 5 to 15 fathoms water; the island runs in a N. E. and S. W. direction, being nearly 10 miles long, and about $1\frac{1}{2}$ mile broad; its coasts are almost straight, and at its further end is the Petit Passage, dividing it from a narrow neck of land which continues so far as the Gut of Annapolis; thus Brier's Island, Long Island, and this peninsula, form the northern shores of

ST. MARY'S BAY—while from Cape St. Mary, upwards into the bay, the southern shore is low, and runs out with sandy flats, in some places almost so far as three-quarters of a mile; the opposite or northern shore, is constituted of high cliffs, having deep water close under them. Nearly mid-channel, and full two-thirds up the bay, is a rocky bank, with 4, 5, and 6 fathoms over it, whilst on each side of it are channels of 12 and 15 fathoms, muddy ground. Far up the bay, on the southern shores, is the River Sisibou, the entrance to which is shoal, with a depth of only 2 fathoms water. At the further end of St. Mary's Bay, is an extensive sandy beach, on entering which you will lessen your depth from 4, 5, and 6 fathoms, to 12 feet, and should you advance, it will become more shallow. On the north side, and nearly opposite to Sisibou River, is Sandy Cove, where vessels, when it comes on to blow hard, may run aground on a bottom of soft mud, and lie sheltered from all winds.

GRAND PASSAGE.—We have already stated that this channel runs in between Brier's and Long Islands; its southern entrance bearing north, distant 29 miles from Cape Fourchu, and N. by W. 12 miles from Cape St. Mary; in running for it, from abreast of Cape St. Mary, you will have no impediment whatever, but a depth of from 14 to 30 fathoms; at the entrance of the passage are 18 fathoms mid-channel, and having advanced within you will perceive Billy Islet; this may be left on either side, although Mr. Des Barres says the western channel is the best and widest; here, a little to the northward of the island, is one of the safest and best harbors in the vicinity; from hence to the northward are 4, 5, 6, and 7 fathoms; following the shore of Brier's Island, opposite its northern point, the water deepens to 13 and 14 fathoms: you are then clear of the Grand Passage, and may borrow towards Long Island, steering N. Easterly, or N. E. by N., into the Bay of Fundy.

PETIT PASSAGE lies at the further extremity of Long Island, and is the channel which separates that island from the main. It is situated about 3 leagues to the northeastward of the Grand Passage, and is 280 fathoms wide in its narrowest part: its shores are bold to, and there are from 20 to 30 fathoms of water within it: a N. N. E. ½ Northerly course, from abreast of Cape St. Mary, will carry you right through it. Near its northern entrance, on the western side, is Eddy Cove, a very convenient place for vessels to anchor in, for here they may ride out of the stream of tide. which commonly runs so rapidly, that, without a fresh leading wind, no ship could possibly stem it.

ANNAPOLIS GUT.—Pursuing the coast along shore from Brier's Island to Annapolis Gut, it has very few curvatures; the shore is bound with high rocky cliffs, above which a range of hills rises gradually to a considerable height; their summits appear unbroken, except at the Grand and Petit Passages, at Sandy Cove, and Gulliver's Hole, where they sink down in valleys, and near the gut, where they terminate by an abrupt and steep declivity. The mariner, in navigating this coast, will, by keeping about a mile or a mile and a half from the land, have 50, 40, and not less than 30 fathoms water all the way; and when at the entrance of the gut, one and a half mile distant from the light-house on Point Prim, he will find the latter depth. The shore on both sides of the gut is iron bound for several leagues; the stream of ebb and flood sets through the gut with the velocity of 5 knots an hour, causing various eddies and whirlpools, but the truest tide will be found off the eastern side, which is so bold to approach that a ship may rub her bowsprit against the cliffs, and yet be in 10 fathoms water. There is a light-house upon Point Prim, the light from which is exhibited from a window 120 feet above the sea, and is an object of pitiful and useless economy; but it may perhaps serve to prevent the fatal error of mistaking the real entrance of the gut from Gulliver's Hole, which the land much resembles, but which the latter has no such distinguishing building upon. Point Prim runs off shoal about 30 fathoms, and off the eastern entrance is the Man-of-War Rock: it lies about a cable's length from the land, and has no channel within it. The entrance to the gut is very narrow, but keep mid-channel, and after you get within it the harbor widens, and ships can anchor on the east or west side of the basin, or run up to Goat's Island; if the latter, they should observe that when they get within half a mile of the island, they must stretch two-thirds of the way towards the larboard shore, until they are past the island, which is shoal all round, and from thence they can steer up mid-channel towards the town.

In addition to the above, Mr. Lockwood observes, "That the abrupt precipices of the high lands which form the gut, cause those gusts of wind which rush down so suddenly and so violently from the mountains. The tide also hurries your vessel through with great force. At the entrance there is no anchorage except close in shore, near the outer western point; in some places the depth is from 40 to 80 fathoms."

ANNAPOLIS TO THE BASIN OF MINES.—From the Gut of Annapolis up the bay to Cape Split, the coast continues straight, and nearly in the same direction, with a few rocky cliffs near the gut, or narrows, and many banks of red earth under high lands, which appear very even. In the channel or narrows leading into the Basin of Mines, from Cape Split to Cape Blowmedown, and from Cape D'Or on the north side, to Partridge Island, the land rises almost perpendicularly from the shore to a very great height. Between Cape Blowmedown and Partridge Island, there is a great depth of water, and the stream of the current, even at the time of neap tides, does not run less than 5 or 6 fathoms. Having passed Cape Blowmedown, a wide space opens to the southward, leading to the settlements of Cornwallis, Horton, Falmouth, and Windsor, &c.; these are now rising into great mercantile consequence, and abound in mines of coal, plaster, limestone, and other valuable minerals. While to the eastward the river extends to Cobequid Bay, having on its banks the towns of Londonderry, Truro, and Onslow, this latter place forming a direct communication with the Bay of Tatmagouche, in the Gulf of St. Lawrence. Off Cape Split there are considerable whirlpools, which, with spring tides, are very dangerous, and frequently run 9 knots an hour. Should a vessel be at anchor between Cape Sharp and Partridge Island, and you should be desirous of proceeding to Windsor River, it will be necessary to get under weigh two hours before low water, in

order to get into the stream of the Windsor tide on the southern shore; otherwise, without a commanding breeze, a vessel would run the hazard of being carried up with the Cobequid tide, which is the main stream, and runs very strong both with flood and ebb; while the Windsor tide turns off round Cape Blowmedown to the southward, and is then divided again, one part continuing its course up to Windsor, and the other forming the Cornwallis tide, running up the river of that name.

In sailing up Windsor River, the house on Horton Bluff should be kept in a south bearing, and the gap in the Parsborough River north; this will carry you through the channel between the flats, which cannot be passed at low water by a vessel drawing 15 feet much before half tide. Off Horton Bluff the ground is loose and slaty, and a ship will be likely to drag her anchors, with a strong breeze, particularly at full and change; therefore, it might, perhaps, be better for men-of-war to moor across the stream, and full one-third from the bluff.

HAUTE ISLAND.—This island is situated at the entrance of the Mine's Channel, and is not 1½ mile in length, and about half a mile broad; it bears from Cape Chignecto S. W., distant 4 miles: the channel on either side is good; that between it and the cape has 14, 20, and 22 fathoms water in it, and that between Haute and Jolyffe Head from 20 to 40 fathoms; it forms a prominent and very remarkable object, from the height and steepness of its rocky cliffs, which, in a most singular manner, seem to overhang its western side; there is, however, a fair landing at its eastern end, and anchorage half a mile off in 18 fathoms, with the low point bearing about N. E. by N.; here also is a stream of fresh water running into the sea. Cape D'Or and Cape Chignecto are high lands, with very steep cliffs of rocks and red earth, and deep water close under them. You have nearly the same kind of shore to the head of Chignecto Bay, where very extensive flats of mud and quicksand are left dry at low water. The tides come in a bore, rushing in with great rapidity, and are known to rise, at the equinoxes, from 60 to 70 feet perpendicular.

CHIGNECTO BAY runs up E. N. E., and may be considered to be the north-eastern branch of the Bay of Fundy; it is divided from the Mine's Channel by the peninsula, of which Cape Chignecto is the western extremity: having advanced about 12 or 13 miles within it, you will see a point on the larboard or northern shore running out to seaward; this is called Cape Enragé, or Enraged Cape, on which there is a light-house containing a fixed light; 11 miles beyond which it divides into two branches, the one leading to Cumberland Basin, and by the River Missequash to Verte Bay, in the Gulf of St. Lawrence, and now becoming a place of very considerable commerce; the other running northerly, and taking the name of the Petcudiac River; these parts, like the Basin of Mines, are fast rising into consequence, and becoming the seat of numerous settlements. The Cumberland Branch is navigable to within 13 miles of Verte Bay; and it is remarkable that when the rise of the tide in Cumberland Basin is 60 feet, that in Verte Bay will only rise 8 feet. The River of Missequash, which runs across the isthmus, is the present boundary between the provinces of Nova Scotia and New Brunswick.

CHIGNECTO BAY TO THE MANAN ISLANDS, AND PASSAMAQUODDY BAY.

THE NORTH COAST OF THE BAY OF FUNDY, from Cape Enraged, towards Quaco, in the township of St. Martin's, is, at present, but thinly inhabited, and it continues to be so as far as St. John's: the land is good, but much broken with steep valleys; the weather is generally humid, the winds boisterous and changeable, and the intervals of sunshine limited and evanescent: but from Quaco to St. John's the interior hills rise in easy inequalities; the ravines of the cliffs are deep and gloomy, and the indentations frequently have beaches: at Black River, which is about 12 miles west of Quaco, is a safe inlet for a small vessel, although it is dry from half tide.

QUACO LIGHT, white and red, horizontal, is on a small rock off Quaco Head, W. ¾ S. from St. Martin's Head; it is a revolving light, time of revolution 30 seconds.

QUACO LEDGE.—This is a dangerous gravelly shoal, situated about 12 miles S. E. ½ E. from Quaco, and W. by N., distant 11 miles from Haute Island; it extends N. W. by N. and S. E. by S. about 3½ miles, and is half a mile broad; vessels have frequently grounded upon this bank; there are several irregular patches of rocks lying off its N. E. side; the ledge shows itself at half tide, and dries for about 100 yards, having but 12 feet water over it with common tides; half a mile to the N. E. the eddies with the flood tides are strong and numerous, the ship's head going nearly round the compass in the space of half an hour; the ebb is a true tide, and sets in a W. S. W. direction towards the ledge; the soundings are from 7 to 14 fathoms, at about two cables' length all the way round, but they shoal more gradually from the N. E.

The night tides here, and generally throughout the bay, are highest: at St. John's they are so during the summer, but the contrary during the winter months, or between

the equinoxes. The mark to go clear to the southward of the Quaco Ledge is Cape D'Or on with the south side of the Island Haute.

ST. JOHN'S HARBOR.—The entrance to this harbor bears from the Gut of Annapolis about N. ½ W., distant 11 leagues: it is distinguished by a light-house which stands on Partridge Island, after mentioned. Vessels coming from seaward, and making for this harbor, should, so soon as ever they can well discern the light-house, make their signal for a pilot; but if unable to succeed in reaching the harbor that tide, then endeavor to run in between Meogenes Island and the main, going either on the south or on the north side of this island, in doing which you will nowhere have less than 4, 5, and 6 fathoms water, with a bottom of sand and mud. Here you will obtain the best anchorage, by bringing the three hills in the country to the N. E. in a line over Rocky Point Island, and the house on Meogenes Island S. E. by S.

THE CITY OF ST. JOHN stands on an irregular descent, having a southern aspect, and on entering the river, has an imposing appearance. Partridge Island is about two miles to the southward of the city, answering the double purpose of protecting the harbor, and, by its light-house, painted white and red, vertical, guiding and directing the mariner to its entrance; the lantern is 166 feet above the level of the sea, and the light is good and well attended. The ground for several miles to the southward of Partridge Island is muddy, the depths gradual from 7 to 20 fathoms, affording excellent anchorage; the passage westward of this island has in it 10 feet, that to the eastward has 16 feet, and abreast of the city are from 7 to 22 fathoms. Three-fourths of a mile to the northward of the light-house is a beacon, black and white, vertical, fixed on the edge of a rocky ledge, forming the west side of the channel, and having deep water close to it. A breakwater is erected further on at the eastern side of the channel and below the town; this greatly intercepts the violence of the waves, which southerly gales usually occasion. Every possible assistance is here given to ships wanting repair, they lie upon blocks, and undergo a thorough examination, without incurring the expense, injury, and loss of time occasioned by heaving them down.

Vessels having made the harbor, and finding themselves able to enter, may, when they have passed Meogenes Island, edge in shore towards Rocky Point, until they perceive Meogenes Point is in a line with, or over the N. W. corner of Meogenes Island; then, sailing in between Rocky Point and Partridge Island, with these marks on, will lead them in the deepest water, over the bar, until they open Point Maspect to the northward of the low point of Partridge Island; when putting the helm starboard, they should edge over towards Thompson's Point, until they get the red store at the south end of St. John's in a line over the beacon; keep them in one, until they have passed the beacon at the distance of a ship's breadth: then haul up N. N. W. for the harbor, keeping the blockhouse, at the upper part of the harbor, open to the westward of the king's store, situated by the water side; which mark will lead them, mid-channel, up to the wharves, where they may lie aground, dry at half tide, and clean the ship's bottom; or ride afloat in the stream at single anchor, with a hawser fastened to the posts of the wharves on shore. The flood tide is weak here, but the ebb runs down rapidly past Meogenes Island into the Bay of Fundy.

Should the tide of ebb have taken place at the beacon, then it would be highly improper to attempt gaining the harbor that tide; but wait for the next half-flood to go over the bar; as both sides of the entrance to the harbor are composed of sharp rocks, which dry at low water; and the tide of ebb, especially in the spring of the year, when the ice and snow are dissolving, is so exceedingly rapid and strong, that all the anchors you possess will not be sufficient to prevent the ship from driving.

"The River St. John," says Mr. Des Barres, "has sufficient depth of water for large ships to the falls; whence it continues navigable eighty miles up the country, for vessels of 100 tons. At Fort Frederick the rise of the tide is 18 feet, and at equinoctial spring tides 25 feet; above the falls it seldom rises more than 4 feet. When the tide has risen 12 feet at the fort, the falls become smooth, after which, during the space of 20 minutes, they are passable. At times of great freshets, which generally happen between the beginning of *April* and the end of *May*, from the melting of the snow, the falls are absolutely impassable for vessels going up the river, for then the tide does not rise to their level."

The falls are situated nearly 2 miles beyond the city of St. John; it is a narrow channel, 80 yards wide, and 400 long; this channel is straight, and has a ridge of rocks stretching in such a manner across it, as to hold and retain the river water from running out into the sea. After passing the falls, you enter a gullet, which is a quarter of a mile wide, and two miles long, winding in different courses, and having 16 fathoms in the channel.—Next to this gullet is a fine and extensive basin, a mile and a half wide, and eight miles long, which enters the main river. The river branches some hundreds of miles up in a serpentine manner; and runs through a country which abounds with timber, coal, limestone, and many other minerals; and the surrounding lands are now becoming highly cultivated. There is water sufficient to navigate vessels of 50 tons, as high as Frederickton, and in all the branches to the lakes adjacent, except in dry seasons.

In the middle of *May*, or earlier in favorable seasons, the snow and ice in the country, dissolving, occasion a general overflow in the river, which, in some years, rises so high as to inundate all the low lands.

In autumn, the River St. John is swoln by rains, and between the middle of *April* and the beginning of *May*, by the melting of the ice and the great quantity of snow that accumulates on the banks of this vast navigable river. From these causes, the water streams out to seaward continually: therefore vessels, at that time, seldom enter the harbor without a fresh leading wind. The falls are then impassable, as the tides do not rise to their level.

The body of the river is 17½ feet above low water mark, consequently after the tide has arisen to that height, the water descends, or literally falls up into the river. When the tide has flowed 12 feet, the falls are smooth and passable for 20 minutes. Above the falls the water rises 4 feet, and at Majorfield, which is 60 miles in the interior, it rises only 1½ foot.

To the W. S. Westward of Meogenes Island is Flat Bay, called also Visarinkum; it is a small harbor, with 5 and 4 fathoms water, used sometimes by the coasters. From hence the land runs nearly W. S. W., passing Negro Head to Cape Musquash; off the point of which is Split Rock; it lies close to the cape, and has 8 fathoms water very near it, being distant from Partridge Island 8¾ miles; the shore is iron bound all the way, and has deep water close in to the land.

MUSQUASH HARBOR lies about a mile to the westward of the Split Rock; its entrance is about half a mile wide, and there is good anchorage a little way in, with 4 fathoms water, but further on a bar runs across the harbor, over which is only 1⅓ fathom; small vessels sometimes pass to the westward of the islands, and run up the river, which, when past the bar, has 2, 2½, and 3 fathoms water: but this harbor is open to the southward.

POINT LEPREAU.—From the entrance to Musquash the coast runs W. S. W. westerly nearly 10 miles to Point Lepreau, on which there is a tower, red and white, horizontal, with two fixed lights, one elevated 18 feet above the other. In this space are 4 or 5 inlets, but only calculated for small craft; the first of these is about 1½ mile to the westward of Musquash western point, and is of no note whatever; in your way to it, a berth must be given to the shore, particularly about Musquash Point, on account of some rocks lying off that part; there are channels between these rocks, but few vessels will venture through them. About a mile further is Chance Harbor, which is a mere shallow cove of 2 fathoms water. Little Dipper is more westerly still, and situated 3½ miles from Musquash Point; this also has only 12 feet water in it, and scarce fit for any thing but boats. Great Dipper is divided from Little Dipper by a flat point of land, round which are several scattered rocks; this harbor can accommodate small craft, which sometimes run in there for shelter; but it is by no means to be recommended, unless in cases of necessity; there is a creek of fresh water runs into it, called Moose Creek. Further westward, and about 1½ mile from Point Lepreau, is Carriage Harbor: this is open to the eastward, and affords anchorage at its entrance in from 7 to 3 fathoms. The land all the way from Musquash to Point Lepreau is high, broken, and many scattered rocks lie off it; therefore vessels, in passing, should carefully give it a good berth.

MACES, or MASON'S BAY, is formed to the westward of Point Lepreau, between it and Red Head; these bear from each other N. W. ¼ N., and S. E. ¼ S., distant full 5 miles. There are numerous rocks, shoals, and small islets within it, but its navigation seems insecure, for Mr. Lockwood emphatically observes, "this point ought to be classed as one of the dangers of the Bay of Fundy; for many serious accidents have lately happened in the neighborhood of this promontory." Maces Bay he calls a deep and ugly indent; so much so, that ships bound to the River St. John, dreading to pass its entrance, get frequently embayed there, and some valuable vessels have thus been lost. "Yet, at the head of this bay," he observes, "is a place called Pok Logan, where there is good shelter. Several rivers appear to fall into this bay; and, perhaps, a better knowledge would tend much to strip it of its fancied dangers."

W. by S. from Point Lepreau, distant 3½ or 4 miles, there is supposed to be a dangerous shoal, but its actual situation is not known: if such should exist, it must be surrounded with very deep water, for a small distance from this imagined situation, are 26, 28, and 31 fathoms, mud, mud and sand, and gravel.

BEAVER HARBOR lies about 4 miles to the eastward of Bliss Island, and is above a mile wide at its entrance, with 10 fathoms water on each side, and 20 fathoms mid-channel. In entering keep the western shore on board, until you bring the Goal Rock to bear east, distant about half a mile, where you may anchor in 4 or 5 fathoms, good holding ground. There are no regular pilots, but the fishermen on the coast are well qualified for the task, although in clear weather they are not absolutely necessary, yet strangers to the place will most probably require their assistance. There are several rivulets running into various parts of the harbor, but there is no convenient watering place.

ETANG HARBOR is situated to the southward of the Magagadawe, and runs in to

the north-eastward of Campo Bello; before it lie many islands. There are three entrances into this harbor, so that vessels may go in or out at any time. The western entrance leads to La Tete Harbor, where anchorage may be obtained in from 10 to 5 fathoms, but there is no passage for ships round the northern end of Payne's Island. The channels between Payne's and Bliss Islands are considered to be the best, as they will admit of vessels working through them; but the eastern passage requires a leading wind. A pilot will be necessary on account of the intricacies of the channel, but one can easily be obtained any where on the coast; water can be procured in various places. The bay is extensive, secure, and well sheltered, having good anchorage throughout.

ST. ANDREW'S HARBOR lies on the eastern side of the entrance of the River Scoodic, and has two entrances; the eastern one is narrow and intricate, but is the deeper, having 4 or 5 feet at low water; the dangers in entering through this passage are a reef of rocks with a beacon on it, extending nearly three-quarters of a mile from Navy Island, and a reef of sand and large stones with a pole on it, extending nearly two miles from the block house on the main land; the narrowest part of the channel is not more than a cable's length; the mark for entering is to keep the town of St. Andrews open, and steer directly in for the harbor. In the bay, in general, there are from 17 to 25 fathoms water.

The western entrance is not so difficult, but has less water than the eastern, the bar being dry at the last quarter ebb. A dangerous reef of stones. with a floating beacon on it, lies off the west end of Navy Island. In steering you must keep close to the northward of the two poles on the bar, where at high water you will have from 18 to 20 feet water.

There is a harbor master and branch pilots belonging to St. Andrews, and large vessels should never attempt to enter without having one of them on board. High water 10h. 45m. Common tides rise 24 feet; spring tides 30 feet.

WOLF ISLANDS.—The Wolves may be passed on either side, having deep water close to them; but they afford no sheltered anchorage, except for small fishing vessels in summer time; they are from 60 to 100 feet high. With light winds, a lee tide, or thick weather, you may let go an anchor any where between the Wolves and Beaver Harbor, in good holding ground, with a depth of 20 or 25 fathoms.

THE MANAN ISLANDS.—Grand Manan is an island situated at the north-western entrance of the Bay of Fundy; it is in the province of New Brunswick, and forms a part of Charlotte County; being 14½ miles in length, and 7 in breadth. According to the chart, the N. Western part of this island is distant from Passamaquoddy Head about 7 miles; its N. Eastern point, or Bishop's Head, bears from Cape Maspeck W. S. W. nearly 10 leagues, and W. N. W. from the entrance to the Gut of Annapolis, about 14 leagues; and from Petit Passage, N. W. by N. 32 miles. Its S. W. end, or head, bears from the light-house on Brier's Island N. W. by N. nearly, from which it is distant 28 miles; and N. W. by W. from the northern entrance to Petit Passage, distant 30 miles. Thus situated it commands an uninterrupted view of every vessel that passes to or from the Bay of Fundy; it is naturally strong, and possesses harbors where the largest ships may ride in perfect security: its fisheries are in great estimation.

On its western side the cliffs are nearly perpendicular, rising 600 feet above the level of the sea; but on this side there is only one little inlet along the whole range, that can shelter even boats; it is commonly called Dark Cove, being situated about 4 miles from the northern part of the island: there is indeed a place called Bradford's Cove, about 5 or 6 miles more to the southward, but this is of no note whatever. There are soundings all along the shore, from Bishop's Head to the S. W. Head, 3, 4, 5, and 6 fathoms close to the land, deepening to 13, 20, 21, and 22, half a mile off, to 30, 40, and 50 fathoms at a mile distance, and still deeper as you increase your distance from the island.

The Northern, or Bishop's Head, is abrupt and bold; but on its eastern side there is anchorage in a place called Whale Cove: this is situated between Swallow's Tail and the North Point; here vessels frequently ride during southerly winds, to wait the turn of tide; the soundings are from 15 to 25 fathoms; but it must not be resorted to in northerly gales.

LONG ISLAND BAY.—This lies to the S. Eastward of Whale Cove, and is formed by the Swallow's Tail, which is a bold, high, ragged, and barren looking point, and Long Island, which bears nearly south from it, distant 1½ mile. This bay is easy of access, and possesses all the advantages of a harbor; the bottom of the bay is generally mud, excepting a ridge of rocks and gravel, which extends from the ledge that shows itself within the Swallow's Tail, and the cluster of sunken rocks that lie half a mile N. N. E. from Long Island Point, and these are 5 feet under water at low spring tides. In the northern part of the bay the bottom is a stiff clay, and vessels ill provided with gear have often rode out the severest gales there; and under Long Island, opposite the beach, is good anchorage, even locking in the northern end of Long Island with Swallow's Tail: the ground here is a strong mud, and you will ride safe and unaffected by sea or wind from any quarter.

Further to the southward, and on the eastern coast of Great Manan, are the Duck Islands; here a pilot will be necessary, for though the ground is good about Great Duck

Island, yet there are dangers which, when the tide becomes high, are completely hidden. To the south-westward of Duck Islands are the Islands of Ross, the northern point of which is scarcely separated from Manan, Cheney's Island, and White Head Island; these are connected together by a sandy and rocky reef of foul ground, which extends S. ½ W. to the Diamond Rocks, of which we shall speak hereafter. On White Head Island resides an able and active pilot, and the cove opposite to his house is commonly a great resort for vessels employed in the fisheries; but with easterly winds, this is no desirable place. At the western side of Ross Island is part of what is called Grand Harbor; it is a shallow muddy basin; but vessels may enter and lie securely in it, on the mud; a convenience somewhat desirable, should you have lost your anchors and cables on any of the outer ledges: the entrance to this place has 4, 5, 6, and 7 fathoms water, with a clayey bottom; the channel is narrow, but secure from the sea.

A little to the westward of White Head Island are the Green Islands, and to the southward of the Green Islands, about one mile, are the three Kent's Islands, these latter are low and ledgy; the eastern, or largest one, is bold to the rocks, which are at all times to be seen; and to the N. Westward of these rocks is a ledge called the Constable, which dries at low water; under the lee of these and the Green Islands, occasional anchorage may be obtained in from 14 to 7 fathoms.

WOOD ISLAND lies off the southern part of Grand Manan, and is one mile and three-quarters long; it runs parallel to the south-west head of Manan, and forms an excellent harbor between; the upper part of this inlet, and the head of it, afford most secure anchorage; and the inhabitants about Seal Cove and Red Head, will furnish you with all necessary supplies you may stand in need of, for these places are all well settled.

THE MANAN LEDGES are those more distant islets, rocks, and dangers, which lie to the southward of Grand Manan; the outer and most dangerous of these is the Old Proprietor, covering a space of half an acre at low water, and drying at half ebb; but when covered the tide sets directly over it, at the rate of 4 miles an hour. It lies S. ½ E., distant 9½ miles from Great Duck Island; S. by E. nearly 7 miles from the north eastern part of White Head Island; E. ¼ S. 6¾ miles from the Gannet Rock; S. E. by E. 4 leagues from the south-west head of Manan; N. N. W. ½ N. 18½ miles from Brier Island light-house; N. N. W. ¼ W. 18 miles from the northern entrance to the Grand Passage; N. W. ¾ W. 18½ miles from the Petit Passage; west 35 miles from the Gut of Annapolis; and S. W. 15 leagues from the light-house on Partridge Island.

About 2¼ miles N. E. ½ N. from the Old Proprietor is the Clerk's Ground; a rocky shoal of 4½ fathoms. N. W. by N. one mile and two-thirds from the Old Proprietor, is Crawley's Shoal, of 7 feet only; and west of the Crawley, one mile and a half, is the Rans, of 5 feet. The Roaring Bull bears N. ½ E. from the Old Proprietor, distant 4 miles; and, although it has 6 fathoms over it, it usually has a heavy dangerous ripple. The marks to go clear to the eastward of all these dangers, is the north-easternmost highland of Manan well open of the Long and Duck Islands; the mark to lead to the southward of them is the south-west head of Manan open to Kent's Three Islands. In easterly winds the tide-rips are impassable.

There are also other rocks within these; a range of which lie south of the south-west point of White Head Island; some of these have deep water between them, and occasion a continual ripple three miles from the shore, quite home to the long point; these are called the Tinker, Three Diamonds, Rans, and many others without names; some of these show themselves, others have only 3 and 4 feet water over them.

S. S. E. ½ S. about three-quarters of a mile from the southern point of the Three Islands is a knoll called the Kent, it is dangerous and has only 7 feet water over it; it bears about W. N. W. ½ W. from the Rans, and is not included within the confines of the mark given to avoid the dangers to the southward, viz. the S. W. head open of all the islands. There is also a danger said to lie S. E. ½ S. from the Kent Knoll, distant 2 miles, and W. S. W. ¾ S. one mile and a quarter from the Rans, but this is doubtful.

THE GANNET ROCK, on which is a light-house, black and white, vertical, is forty feet above water, and lies S. W. by S., distant 3¼ miles from the southern point of the Three Islands, and S. S. E. 6¼ miles from the S. W. head of the Grand Manan; it has a number of small ledges and sunken rocks about it, which are always breaking: this stands conspicuous, being in the immediate vicinity of all the sunken rocks and dangers. Nearly W. S. W. from the Gannet, distant one mile and a half, is St. Mary's Ledge; part of which is always above water; and to the northward of St. Mary's Ledge, one mile, is the Long Ledge, equally visible; between and around these are numerous rocky shoals, with deep water between them, rendering this part particularly dangerous. Other reefs are supposed to exist to the westward, and between the Gannet Ledges and the Machias Seal Islands; their imaginary situations are marked on the chart, but no further particulars of them are known.

SEAL ISLANDS.—W. by S. ½ S. from Grand Manan lie the Western Seal Islands. On the western island two light-houses are erected, showing fixed lights, distant from each other about 140 feet, in the direction of E. S. E. and W. N. W., by which they

are distinguished from all other lights upon the coast; they are elevated about 50 feet above high water mark. From the westernmost of these light-houses the following bearings were taken:

To the southernmost of the Murr Ledges E. S. E.
To Gannet Rock light-house, E. by S. $\frac{1}{4}$ S. about 12 miles.
To N. E. Rock, N. E. by N. about $1\frac{1}{2}$ mile.
To the southern head of Grand Manan, E. by N. $\frac{1}{2}$ N.
To West Quaddy light-house, N. N. E.
To Little River Head, N. by W.
To Libby Island light-house, N. W. by W.
To south point of Kent Island, (on the chart three isles,) East.

GENERAL DIRECTIONS AND REMARKS FOR SAILING TO AND WITHIN THE BAY OF FUNDY.

Ships navigating the Bay of Fundy have to encounter an atmosphere almost constantly enveloped in dense fogs, the tides setting with great rapidity over the rocks and shoals with which it abounds, and a difficulty of obtaining anchorage on account of the depth; so that, under these circumstances, the most unremitting attention is requisite to prevent the disastrous consequences which must necessarily attend a want of knowledge and caution.

When you are off Cape Sable with a westerly wind, and destined for the Bay Fundy, it will be advisable to make for the coast of the United States, somewhere about the Shuttock Hills, or Tit Manan light-house, as you can pass with greater safety to the westward of Grand Manan than to the eastward, having also, if necessary, shelter in Petit River, Machias, Passamaquoddy, Etang, or Beaver Harbor, &c.

Between Grand Manan and the State of Maine the passage is free from danger; vessels beating through generally stand from side to side, particularly during fogs, the depth being from 12 to 70 fathoms, with a bold shore on each side, and the tide through strong and regular.

When steering between Grand Manan and Brier's Islands the utmost caution is requisite during thick weather, as vessels are frequently drawn in among the islands and ledges to the southward of Manan, by the flood setting directly upon them; the most dangerous of these is the Old Proprietor, which, at low water, dries for the space of half an acre. When the wind, therefore, veers at all to the southward, make the best of your way to St. John's Harbor, or you may secure an anchorage in Grand Passage or St. Mary's Bay, as it seldom blows in that direction above 18 hours without bringing on a fog.

There is no difficulty in going through Annapolis Gut, if you have but a commanding breeze, although the tide is very rapid, the flood and ebb running 5 knots an hour, and the eddies strong; about one-third through lies the Man-of-war Rock, about a cable's length from the eastern shore; therefore, if you keep mid-channel, you will be sure to clear it.

The prevailing winds here, and throughout the whole coast of Nova Scotia, are from W. S W. to S. W. nearly as steady as trade winds, except during the summer months, when they become rather more southerly, accompanied with but little intermission of fog, which requires a N. Westerly wind to disperse. It is therefore recommended not to leave an anchorage, without making proper arrangements for reaching another before dark, or the appearance of a fog coming on, which with a S. W. wind is so sudden, that you become enveloped within it unawares: neither should you keep the sea at night, if you can avoid it. But you will observe that, whenever the wind blows directly off the land, the fog will soon disperse.

TIDES.—The tides at the entrance and within the Bay of Fundy are very rapid, but regular, and although the wind against them alters the direction of the ripplings, and sometimes makes them dangerous, yet it has little or no effect upon their courses. The flood tide sets from Cape Sable to the N. Westward, through the Seal, Mud, and Tusket Bald Islands, at the rate of 2 or 3 miles an hour; and in the channels among the islands, it increases to 4 and 5 miles; from thence taking the direction of the main land, it flows past Cape St. Mary, and then N. N. W. towards Brier's Island: it runs up St. Mary's Bay but slowly, which adds to its strength along the eastern shore; then increasing its rapidity as the bay contracts, it rushes in a bore into the Basin of Mines, and up Chignecto Bay; so that here the water sometimes rises to the extraordinary height of 75 feet.

To the above may be added the additional observations: "The great volume of fresh water which constantly flows down the harbor of St. John, in April and May, causes a continual ebb tide, during that period, sometimes to the depth of nearly 5 fathoms, under which the flood and ebb tides flow regularly; the maximum of its velocity was found to be four knots and a half, and the minimum at two knots; but as the log floated very deep in the fresh water, and ultimately sunk into the salt water, underneath, it will not be too much to estimate the maximum at five knots, and the minimum at two knots and a quar-

ter. The fact of the under-tide beginning at the depth of nearly 5 fathoms was ascertained by sinking a lead down to that depth, when it was carried the same way as the current on the surface; but when lowered below that, it was drifted in a contrary direction.

"Between Brier's Island and the opposite northern coast, and for some distance up the bay to the eastward, the first of the flood sets strongly, nearly north, so that it will be extremely dangerous for a vessel to run in the night, or during thick weather, from any part of the southern towards any part of the northern coast, without making a large allowance for the set of the tides, and keeping the lead constantly going; the Jaseur, Captain Napier, was nearly run on shore, having been drifted by this tide in a fog, eight miles and a half in three hours and ten minutes.

THE COAST OF THE UNITED STATES,

FROM PASSAMAQUODDY TO CAPE COD.

BANKS.—There are four banks on this part of the coast: Jeffrey's Bank, Jeffrey's Ledge, on both of which there are from 30 to 50 fathoms water, Cashe's Ledge, which is dangerous, and George's Bank and Shoals, also dangerous. We have no particular information, excepting of the two latter.

CASHE'S LEDGE.—The position or extent of this shoal is not accurately determined. The following is from the master of H. M. ship Beaver:

I took my departure from Thatcher's Island, which lies two miles to the eastward of Cape Ann. The island bore from me north, 3 miles distant; from the bearing, I steered E. ¾ N. 65 miles, with a fair wind, and fell in with the north part of the bank, where Cashe's Ledge is, about two leagues to the northward of the shoal, in 60 fathoms, hard black clay. This bank lies N. and S. seven leagues, and E. and W. two leagues, and in the centre of the bank is the shoalest ground. Its length and breadth is one quarter of a mile. There are on it in some parts 10 fathoms, in others only 4½—all exceeding rocky. In the length of a boat you will have from 10 to 4½ fathoms, and there are 17 fathoms within a cable's length of the shoal, which gradually deepens as you stand from it, all over the bank, to 90 fathoms: at this sounding you are on the edge of the bank. You will, in general, have upon the bank oozy and sandy bottom, with black stones and broken shells, till you get into 25 or 30 fathoms; it then becomes rocky.

The current sets exceeding strong and irregular; in less than an hour it will run all round the compass. All ships and vessels should endeavor to steer clear of this shoal, for I am persuaded, that in a fresh gale of wind they must strike; if not, the sea must run so as to founder them.

By four days' observation, the weather being exceedingly clear, found the shoal to lie in lat. 43° 04′ north, long. 69° 11′ west.

GEORGE'S SHOAL.

A Report relative to the survey of George's Shoals, made in Sloop Orbit, by direction and at the expense of E. M. Blunt, assisted by the United States Schooner Science, under authority of Capt. Isaac Hull, at his request, in 1821.

There are, properly, four shoals on George's Bank; the whole of them included between latitudes 41° 34′ N. and 41° 53′ 30″ N. and longitudes 67° 18′ W. and 67° 59′ W. Between them there are from 15 to 35 fathoms water.

The largest, and on which is the chief danger, is the most southerly and westerly. It is somewhat triangular, with a long and narrow spit making out from the S. E. angle. The S. E. point is in latitude 41° 34′ N. and longitude 67° 40′ W. The west point is in lat. 41° 42′ N. and longitude 67° 59′ W. The N. E. point is in latitude 41° 48′ N. and longitude 67° 47′ W. The eastern side of this shoal, although somewhat irregular, runs nearly S. S. E. and N. N. W. having on it from three feet to nine fathoms at common low water. It is composed of a great number of sand spits, very narrow, so that the width of a narrow vessel will make several fathoms difference in the depth of water. The general range of the spits is from S. E. to N. W. As there are no rocks, they are consequently liable to change, in some measure, their positions and ranges. On the eastern edge, even in calm weather, unless it be high or low water, the tides run with great rapidity, and form considerable breakers when setting to the westward, and a large waterfall when setting to the eastward. This is accounted for, by a knowledge of the fact, that directly on the edge of this shoal, there are from twelve to sixteen fathoms of water, so that the edge forms a species of dam, stopping the force of the flood tide, and over which the ebb falls.

When there was considerable wind, we observed that the breakers were higher within the edge, to the westward, than on the edge; and I have no doubt that the water there was still shoaler, and that we should have seen the sand had it not been for the heavy sea. The breakers were such, unless it were entirely calm, that it was impossible to go among them with boats; nor was it considered safe to attempt it with the vessels. For, besides the danger of striking on the hard sand spits, the vessels would have been liable to be filled by the breakers. Even on the eastern edge, and at nearly slack water, the vessels were at times nearly covered with them. And it was not thought necessary to attempt it, as the objects of survey, to ascertain if there was danger on the shoals, and the situations and extent of them, could be accomplished without the risk.

Had not the sea been very smooth, and at high water, we should not have been able to have gotten on where we found three feet, reducing it to low water. The prevailing wind was to the eastward; and I have no doubt but that this place would have been bare with any continuance of an off-shore wind.

I think there are no rocks about the shoals. We had one cast on the S. W. side, which indicated rocky bottom, in 15 fathoms; but I believe it to have been some sharp stone that the lead struck on, although I have marked it according to the appearance, on the chart. (This chart is published by E. & G. W. Blunt.)

The centre of the northern shoal is in latitude 41° 53′ 30″ N. and longitude 67° 43′ W. It extends east and west about four miles. The shoalest part, having six fathoms, is very narrow, and composed of hard sand. But there are not more than twelve fathoms of water for three miles south of the above latitude. On the north side, at two cables' length from the shoal, the sloop dropped into 33 fathoms. The breakers on this shoal are very heavy, and when there should be a sufficient sea to endanger a vessel, they may be seen some miles, and heard at a very considerable distance; and as the shoalest part is not more than a cable's length inside, and no danger near it, a vessel might avoid it.

To the eastward of the last mentioned shoal, in latitude 41° 51′ N. and longitude 67° 26′ W., is another small shoal, with eight fathoms water, having, however, considerable breakers. There are but 17 fathoms for three miles north of it; but very near to the east of it, are 31 fathoms, and from 20 to 30 fathoms to the south and west.

The centre of the east shoal is in latitude 41° 47′ N. and longitude 67° 19′ W. It is about two miles long from east to west, and has several fathoms water. To the south, there are but 17 fathoms for two miles. In other directions there are from twenty to thirty fathoms.

The above described shoals, I am confident, are all which are on George's Bank. Their positions and sizes may be relied on, as well as the places of the soundings which I have laid down on the chart. They were ascertained by a vast number of celestial observations, taken with good and well adjusted instruments on board the two vessels, and very carefully and faithfully calculated. The rates of the chronometers were found by a transit instrument previously to sailing from Boston, and after our return, and all the observations re-calculated for the small variation which appeared.

At anchor, different places, and on different days, we determined the set and strength of the tides, and as nearly as possible their rise and fall. The rise of them is from one to one and a half fathom. They set round the compass every tide, setting S. E. nearly, at full moon, and running from one to four knots per hour, at a mile's distance from the breakers. The mean rate, however, is materially varied by the winds; they set strongest at W. S. W. and E. N. E., and which is undoubtedly the strength of the flood and ebb. From these causes and variety in the tides, arises a principal danger in approaching the shoals. When under way about the shoals, in a few hours time we found ourselves drifted far out of our reckonings, and to ascertain our situations, when both vessels were under way, we took continued observations for the longitude by the chronometers, and at the same time double altitudes for the latitudes; which latter were calculated by Brosier's new and certain method. By allowing for the sets of tides, as ascertained at anchor, the observations and reckoning agreed very nearly, so that the latitude and longitude of every sounding placed on the chart may be considered as certain. Should any vessel fall in with the shoals, a knowledge of the course and strength of the tides would be of the greatest importance. And they can be calculated for any day and hour by the preceding facts.

In going from Cape Cod to the Shoals, at 5 leagues from the light, there are 86 fathoms, muddy bottom. The water gradually deepens to 133 fathoms; and then gradually decreases towards the shoals. In lat. 41° 51′ N. and long. 68° 11′ W. there are 90 fathoms. In lat. 41° 50′ N. and long. 68° 3′ W. there are 49 fathoms, sand and gravel, on the western edge of the bank. The water then shoals fast. To the northward of the shoal, in lat. 41° 59′ N., and long. 67° 52′ W., on the south side of the north channel, there are 60 fathoms, soft mud. In lat. 42° 12′ N., and long. 67° 51′ W., there are 102 fathoms. In lat. 42° 10′ N., and long. 67° 18′ W., there is no bottom at 175 fathoms. To the eastward we did not ascertain the extent of the Bank. In two miles southward of the S. E. point of the shoals, there are from 20 to 26 fathoms of water, which soundings continue for at least 20 miles to the southward and westward.

The bottom on the Bank, so far as we ascertained it, is of such a narrow character, that it is difficult for a vessel to ascertain her situation by it. We often found a great variety of soundings in a very short distance; such as sands of various colors, and differently mixed, coarse and fine, gravel pebbles of various colors, stones, sponge, and shells. Of all these, except sand, I saved a number of specimens, with marks to note the places from whence they were taken.

It may be worthy of remark, that at one cast of the lead, on examining the arming, I found one-third black sand, one-third white, and one-third green shells, in as distinct dimensions as they could have been drawn.

Notwithstanding this variety, some general character of the soundings may be useful. To the westward of the shoals, and at some distance from them, the bottom is coarse sand and gravel, of all colors; to the N. W., a mixture of white, black, and yellow sand; to the N., black and white sand; to the N. E., chiefly gravel and pebbles; to the E., fine white and yellow sand; and in lat. 41° 57′ N., and long. 68° 40′ W., some white moss: to the S. E., fine white and yellow sand.

As the shoals are approached, in whatever direction, the soundings become coarse, and are frequently mixed with shells of different kinds. Near the shoal much of the bottom is pebbles; and to the east of the largest and most dangerous shoal, there are stones of the size of hen's eggs, with moss and sponge on some of them. Near the S. E. point are from 15 to 20 fathoms; a prevailing character of the soundings is green shells, and chiefly of the species usually called sea eggs. If a vessel be far enough south to avoid danger, she will have no shells. The quality of the soundings, as far as we were able to survey the bank, will be best understood from the chart, where they have been carefully rated.

The time and weather prevented making a complete survey of all parts of the bank; and although we ascertained the boundaries of it to the westward and northward, I have not delineated it on the chart, being unwilling to borrow any thing from charts which disagree so essentially, and which we found very incorrect in the material points. Of the shoals themselves, I do not believe a more perfect survey can be made; unless in a calm time, the main shoal could be penetrated. This, however, does not seem to be an object, as no vessel would be safe in attempting to pass over it.

The reports that rocks have been seen on the shoals are undoubtedly incorrect. Had there been any there, we could not have failed of discovering them. At the west part of the bank, in strong tide rips, we saw large quantities of kelp and sea weed, which, at a distance, had the appearance of rocks. But on sounding, we found good water, and regular and clear bottom.

It will be seen by the bottom that the holding ground is not good. But the vessels employed in the survey, by having a long scope of cable, rode out a considerable gale of wind for 22 hours, on the east side of the main shoal and to windward of it. At this time the sea broke very high in 10 fathoms water.

Since this survey, in 1821, the shoal has been re-surveyed by Lt. Charles Wilkes, and others, in the U. S. brig Porpoise, in the year 1837, and from his report the following is taken:

"The shoalest water found on any part of the Bank was 2½ fathoms, or 15 feet, reduced to low water; and this is only to be found in two small places, viz.

Lat. 41° 40′ 13″ Long. 67° 44′ 10″
Lat. 41 40 33 Long. 67 44 30

"The whole of the Shoal is composed of hard sand spits—fine sand on the shoalest places, and coarser as the water deepens, until it becomes large pebbles without sand."

"The rise and fall of tides is 7 feet, extremely regular, the first part of the flood setting N. N. W., the latter part N. by E., and ebb S. S. E. and S. by W. The flood runs 4½ hours, ebb 5½ hours; greatest velocity two and six-tenths of a mile, from half an hour to two hours in changing, going round with the sun on from north by way of east. The wind has but little effect on the velocity. High water, at full and change, at 10 o'clock 30 minutes. Variation of the compass 8° 15′."

NOTE.—In coming from the southward for George's Bank, you will get soundings in lat. 40° 4′ N., if on the S. S. W. part of the Bank. Should you not get soundings in the lat. of 40° 30′ N., you may be certain you are to the eastward of the shoal, when you must direct your course accordingly to clear it, when your first soundings will be in 75 to 60 fathoms. When steering to the northward, you will shoalen your water gradually to 20 fathoms, when you will be in latitude 41° 20′ N., which depth of water you will have 10 or 12 leagues distant, either east or west.

Soundings from George's Bank continue W. by S., until you are nearly abreast of the east of Long Island, then southward to Cape Hatteras.

THE BAY OF PASSAMAQUODDY abounds in good anchoring places, well sheltered from all winds, and divides the United States from that of the British territory.

There are three passages into Passamaquoddy Bay, namely, the Western Passage, the Ship Channel or Middle Passage, and the Eastern Passage. The first is that between the isle of Campo Bello and the main land to the west. Middle Passage lies between Campo Bello and Deer Island, and the Eastern Passage is to the eastward and northward of both islands, which is preferred, being of easy access, with good depth of water.

WESTERN PASSAGE.—Vessels bound to West Quoddy Bay, and being to the westward of the light-house, should give the shore a berth of ¾ of a mile, and steer N. E. by E., which will carry you clear of Sail Rock; and when the light, or sound of the bell bears W. N. W., you may steer N. W. 1½ mile, which course and distance will bring you up with the Spar Buoy on the Middle Ground, and if low water, here you may anchor and wait for the tide to go over the bar, which you cannot cross until 2½ hours flood; but if high water, and you wish to continue through the Narrows—

Bring the Red Buoy to bear N. by W. ½ W., and steer direct for it. You may go on either side, by keeping it close on board, and after passing it one cable's length, steer N. E. by N. for the Black Buoy, which you leave on your larboard hand; and after passing it half a cable's length, steer N. by W. for Delesdernier's Point, which you must keep close on board.

After passing this point you must keep in the middle of the Narrows, due regard being had to the tide, as it runs upon the flood and ebb from 3 to 5 knots.

West Quoddy Head light may be seen at sea, in clear weather, 6 leagues.

It is situated on the S. E. side of Quoddy Head, and contains a fixed light, elevated ninety feet above the level of the sea. It bears from the Southern Head of Grand Manan N. ¼ E., distant about 16 miles; and from the Northern Head of said island, W. N. W., distant about nine miles.

Sail Rock bears from the light S. S. E., about ⅜ of a mile: it is not covered at high water, and at some distance has the appearance of a sail, from which it derives its name. There is a passage between it and the main shore, at low water, but which had better not be attempted, unless forced by the currents, and light winds. Near the above mentioned light-house is an alarm bell, weighing 28 cwt. 2 qrs., (twenty-eight hundred weight and two quarters,) which is, at present, rung by hand, and may be heard at sea, from 3 to 6 miles, in thick weather.

Liberty Point bears from the light E. N. E., about one and a half mile, this being the southernmost point of Campo Bello Island, and forming the eastern side of West Quoddy Bay.

West from said Point, about ⅜ of a mile distant, lies a rock, called Black Rock, which is not covered at high water, and is bold all around.

The middle ground is a shoal, near the middle of West Quoddy Bay, about ¼ of a mile in circumference, with a good channel on either side of it. The shoalest part is often dry. On the western part of the shoal is a Spar Buoy, moored in five feet at low water, and which bears from West Quoddy Head N. N. W., distant about one mile.

From the above mentioned Buoy, N. W. by N. ¼ N., about 1½ mile distant, is a Nun Buoy, painted red, and moored in two fathoms at low water. To the southward of this Buoy is a rocky bar, extending from Campo Bello Island to the main shore of West Quoddy Bay, and which is nearly dry at low water. N. N. E., distant half a mile from the above Red Nun Buoy, is a similar buoy painted black, moored in 4 feet at low water, on the eastern part of the Muscle Bank, so called, which is bare at half tide.

From the Black Buoy to Delesdernier's Point, it is N. ¼ W., distant about ⅜ of a mile. This point is very bold, and may be known by a number of fish houses upon it, which may be seen on the larboard hand, in running through the Narrows.

The entrance of West Quoddy Bay is wide, and the shores are bold, and may be neared until up with the Spar Buoy. If in want of a pilot, by displaying a signal, one can be obtained at the light-house.

MIDDLE PASSAGE.—If bound into Passamaquoddy in a large vessel, your best way is to go to the eastward of Campo Bello Island, on the north-east point of which is a light-house, 60 feet above high water mark, containing a fixed light: it is placed between the main ship channel and the northern entrance into Head Harbor, and within 250 feet of the extreme point. Ships in entering into the main channel, or vessels bound to Head Harbor, may safely pass at a cable's length from the light-house. In sailing up the main channel, care should be taken not to keep far from the shores of Campo Bello, as the flood tide sets directly over from the point at the light-house, to the islands and ledges on the north side of the channel, which is here upwards of a mile in width, and at two hours flood the tide sets directly towards the Black Rock, which is a very dangerous ledge between Spruce and Casco Bay Islands, upon which several vessels have been wrecked; after passing up and leaving the light about a mile to the eastward, the tide becomes more regular, and sets along the direction of Campo Bello shore.

Common tides rise here 25 feet. At full and change it is high water at half past 11 o'clock at Moose Island, and runs, when strongest, between Moose Island and Marble

Island, and between Deer Island and Campo Bello, nearly 5 miles an hour. In the western passage, common tides rise from 20 to 25 feet, and within Passamaquoddy Bay the stream of tide is scarcely perceptible.

Vessels from the southward, when bound up for this bay, should make for the western coast, or that of the United States, as it is the most clear, and the flood most favorable, being from 7 to 8 miles wide: both shores bold, the depth quickly increasing, on each side, from 12 to 70 and 75 fathoms; the greatest depth near Grand Manan, where you haul quickly from 10 to 75 fathoms.

With the light bearing S. S. E. or S. E., there is a depth of 19 and 20 fathoms, where ships may anchor securely from all winds.

Off the N. E. end of Campo Bello, is a remarkable large rock, called the White Horse Rock.

CAMPO BELLO LIGHT-HOUSE.—The following bearings were taken from the top of it:

To the East Point of Grand Manan, (Fish Head,) S. 18° E., or S. by E. ½ E.

To the southernmost of the Wolves, S. 66° 30 E., or E. S. E.

To the northernmost do. S. 87° E., or E. ½ S.

To Point Lepreau, N. 84° E., or E. ½ N.

To entrance of Beaver Harbor, N. 70° E., or E. N. E. ½ E.

To the White Horse Island, the top of the rock, which is white, N. 45° E., or N. E. This you leave on the starboard hand.

Spruce Island bearing from N. 6° E. to N. 15° W.

To Black Rock, very dangerous, N. 61° 30 W., or N. W. by W. ½ W.

To Casco Bay Island, N. 33° W., or W. ½ N.

HEAD HARBOR, at the N. E. Point of Campo Bello Island, is a secure and safe place, small, but of easy access, and with 6, 7, and 8 fathoms water, muddy bottom.

HARBOR DELUTE lies on the western side of Campo Bello, and at its S. W. end is Snug Cove, a good harbor. Moose Island is on the opposite side of the channel, and belongs to the United States. The entrance to Passamaquoddy comprehends a space of nearly twelve miles.

If bound for Moose Island up the River Scoodic, as you pass Todd's Head, (which is half a mile N. E. from the town landing on Eastport,) give it a berth of half a mile, as a ledge of rocks lies off it. Having passed this head, the course and distance to Oak Point or Devil's Head, will be N. by W. 8 leagues; in going which distance, (24 miles,) you pass Fross' Ledge on your larboard hand, six miles from Todd's Head, and three-quarters of a mile from the land; when continuing your N. by W. course 5 leagues, you will come to Robinstown, two miles above which, off a small island, from which it bears N. E., is a shoal on your larboard hand, and to avoid it you must keep your starboard hand best on board, till you come up with Neutral Island, which you leave on your larboard hand, one-fourth of a mile distant; and your course from this to the Devil's Head, (before mentioned,) which you leave on your larboard hand, is N. N. W. 3 miles. When you have passed the Devil's Head, your course is W. N. W. 1 league, when you will come to a large ledge of rocks that you must leave on your larboard hand, which is bare at two hours ebb, and extends half way across the river. Keep your starboard hand on board, and when you pass this ledge, your course is W. S.W., distant one mile, to Turner's Point, and from said point to the harbor, your course is N. W. by N., distant three miles, and the next reach to the falls is W. N. W., distant one mile; the tide flows here 25 feet, and there are only 6 or 7 feet in the channel at low water, with long flats of mud on both sides. The Devil's Head may be seen at the distance of 10 or 12 miles.

There are several good harbors on the west side of this river, and all the difficulty is the great depth of water, which is, in general, from 18 to 24 fathoms. There is also a good harbor on your starboard hand going into Deer Island, which lies to the southward of St. Andrews, 2 leagues distant. It may be easily known, as there is a large bay between the two islands, which lies N. E. from the River St. Croix, 3 leagues distant.

LITTLE RIVER.—This harbor bears due west from the middle of Grand Manan Island, and is called Little River, but you cannot see it except you are near the north shore. You must not run in for it before it bears N. W., or N. N. W. There is a bluff point of rocks on the starboard hand, as you go in, and an island in the middle of the harbor. As you pass in, leave the island on your larboard hand, and when you have passed it half a mile, you may anchor in 4 or 5 fathoms, muddy bottom, and remain safe from all winds. Your course from this harbor to West Passamaquoddy light, is N. E. by E. ½ E., distant 4½ leagues.

MACHIAS.—If you are bound to Machias or Passamaquoddy, your course from Mount Desert is E. 10 leagues, which will carry you up with Mooseapeck light, which you leave on your larboard hand; then steer N. E. by E. 2½ leagues, for Machias light, a fixed light, 65 feet high, on Libby Island. After you have passed the light, and have the passage well open, steer North, until you pass Cross Island, which you leave on your starboard hand; but in passing Cross Island, you must be careful of some dangerous ledges

lying off it 1½ mile, in a S. W. direction, on which course you will leave a large white rock on your larboard hand; keep on this north course until you pass a round high island on your larboard hand, when you may shape your course W. N. W., or N. W. by W., for a point that is covered with young birch trees, and a house on it, for on the starboard hand there is nothing but flats and shoals. You may keep your larboard hand after you pass this house, until the river opens to the northward, when you may run up to Cross River, where you may anchor in 4 fathoms; but if you are bound up to the S. W. mills, you must haul away to the westward. When you get up with Mr. Parker's house and barn, which are on the starboard hand, you must leave the barn open to the south-westward of the Pott-Head. This Pott-Head is a large hill that you leave on your starboard hand.

JONES HARBOR.—After passing the above large white rock in your north course, haul to the westward for one-half mile; bring a high round island that is covered with trees to bear N., when you may anchor in 4 or 5 fathoms, muddy bottom.

MOOSE A BECK HEAD LIGHT is on Mistake Island; it is 54 feet above the level of the sea, and contains a revolving light; time of revolution 4 minutes, showing in that time two bright faces.

MOOSE A BECK REACH.—When you come from the westward, and pass Ladle Island on your larboard hand, steer N. E. by E. for Tibbet's Island, which you leave on your larboard hand. When you come to the east end of this island, give it a good berth, for at low water there is a ledge of rocks that lie a cable's length to the S. E. of said island. When you pass it, and bring Moose a Beck Reach open, you may steer east for Mr. Beal's house; but you must keep the starboard hand best on board, for there is a rock that lies about the middle of the sound, which has not above two feet of water on it at low water. You may anchor to the westward of Mr. Beal's house.

When bound to the eastward over Moose a Beck Bar, which you must not cross before two hours flood, you steer for Kelley's Coffee House, which lies on the larboard hand, as you go to the eastward, on the N. E. point of Moose a Beck Reach. When you are entering on the bar, you will bring a bushy tree right against Kelley's House, which stands on the point. Your course over the bar is east. You leave the Virgin's Breasts, one on your starboard and one on your larboard hand; but if you are bound to Chandler's River, you will leave the Virgin's Breasts on your starboard hand, and Rogue's Island on the same hand. There is a muddy bar that lies between Rogue's Island and the main land, but water enough on it at two hours flood. Rogue's Island has a good harbor at the N. W. of it, safe from all easterly winds, and a small distance from Chandler's River.

When you go over Moose a Beck Bar, bound to Machias, you leave the Virgin's Breasts as before mentioned, keeping your course east, and a bare rock, called Pulpit Rock, on your starboard hand; you must keep Libby's Island light open to the southward of this bare rock. [N. B. This bare rock, which you leave on your starboard, may also be left on your larboard, and steer E. S. E. for Libby's Island light.]

MOOSE A BECK HEAD TO MACHIAS.—Give the light a berth of one mile, leaving it on the larboard hand, and steer N. E. by E. 2½ leagues, when you will be up with Libby's Island light on your starboard hand; then run N. N. E., 2 leagues, which will bring you up with Stone's Island, on your larboard hand, having a rock lying E. one-third of a mile from the centre of the island; from this steer N. for Round Island, from which follow the eastern directions for Machias.

CAPE SPLIT HARBOR.—When you pass Titmanan light, bring it to bear S. W. ½ S., and steer N. E. ½ N. for Cape Split, distant 5 leagues, which course will carry you safe into the harbor. In steering said course, you will make a black rock, which you leave on your starboard hand, distant one mile from Cape Split. This harbor is safe from all winds but S. W., which blows right in; but if you anchor in a cove on the starboard side, and moor N. W. and S. E., you will lie safe from all winds.

NASHS' ISLAND, at the entrance of Pleasant River. There is a light-house, 47 feet above the level of the sea, on this island, containing a fixed light of a deep red color, which you leave on your starboard hand going in.

Directions for Sailing into Moose a Beck Reach by Nash's Island Light.

Coming from the westward, you must leave Petit Menan light on your larboard hand, giving it a berth of half a mile; then steer N. E. ten miles, which will carry you up with Nash's Island light, leaving it on your starboard hand, one-fourth of a mile, when you must steer N. E. by E. two and a half miles, which will take you into Tibbett's Narrows. These narrows are formed by Tibbett's Island on the N. W. side, and Ram Island on the S. E.; this passage is a quarter of a mile wide: from the middle of which you must steer N. E. ½ E. one mile, which will bring you up with Shabby Island, leaving it on your starboard hand one-eighth of a mile; and when half a mile above it, you may anchor in from 5 to 6 fathoms, good holding ground, Shabby Island bearing S. W. by S.

Coming in from sea, and to the eastward of all the shoals and ledges hereinafter men-

tioned, bring Nash's Island light to bear N. by W. and run for it, taking care not to approach the southern end of the island nearer than half a mile, as there is a sunken ledge fully one-third of a mile from the shore.

Vessels may anchor on the N. W. side of Nash's Island, and find a tolerable shelter from easterly and S. E. winds, one-fourth of a mile above the light, and one-eighth of a mile from the island, in 10 fathoms, soft bottom, being but a little out of the regular track from the light to Tibbett's Narrows. In coming from the light to the narrows, you leave on your larboard hand, about half a mile, a large black rock, generally known by the name of the "Pot;" the next is Ladle Island, formed very much like a ladle, and about one mile above the light; this you pass within a quarter of a mile in steering the regular course: the next land on your left is Tibbett's Island, the entrance of the narrows, as before described. It may be proper to observe that Tibbett's Island appears to be a part of the main land until you get above the narrows.

On the right hand, between the light and said narrows, are several islands and ledges, but they lie a good distance from the regular track.

Any ship, no matter how great her draft of water, may enter Moose a Beck Reach by following the above directions.

The following are the bearings and distances of rocks and ledges from Nash's Island light, which must be borne in mind when you are compelled to deviate from the given directions:

Black Rock, (always above water,) S. E. by S. ½ S., 3½ miles.

Jourdan's Outer Ledge, which is covered at high water, S. W. by W. ½ W., 4 miles.

PLEASANT RIVER.—When you come from the westward, and bound to Pleasant River, in passing Titmanan light, bring it to bear S. W. by S., and steer N. E. by N., 3 leagues distant. In steering said course, if it is clear weather, you will see Capt. Wasse's house open between the island and main land; but this passage will not do at low water. You must leave this island (and a high dry ledge of rocks that lie to the westward of it) on your starboard hand; when you pass the bare ledge, you will see a bare isle, which you leave on your starboard hand; then you may haul up for Capt. Wasse's house and anchor, and take a pilot for Pleasant River, as it is not safe going without one, except you are well acquainted.

Narrow Gauges is one mile to the westward of Pleasant River, too difficult to be described, as there are sundry small islands at the mouth of the harbor or bay. The best way for a stranger is to go into Cape Split Harbor and get a pilot, as there is no difficulty in going into Cape Split in the day time, keeping the larboard hand best on board.

TITMANAN LIGHT is a fixed light, 53 feet above the level of the sea, on the south end of Titmanan Island; there are several dangerous ledges bearing from the light.

A ledge S. E. by S., 5½ miles distant, with 9 feet at low water.

A ledge S. S. E., 2 miles distant, with 16 feet at low water.

Jackson's Ledge, E. ½ N., 4 miles distant, with 9 feet at low water.

Moulton's Ledge, W. by N., 4 miles distant, nearly bare at low water.

BOWBEAR HARBOR.—In coming from the westward, bound to Pigeon Hill, or Bowbear Harbor, bring Titmanan light to bear N. E. and run for it, giving it a berth of one-fourth of a mile, and then steer N. ½ W. 4 miles: in steering this course, you will leave the Egg Rock on your starboard hand, when you will make the westerly shore, giving it a berth of half a mile; then steer N. N. E. one mile, when you will be opposite Dyer's house, where you may anchor safe from all winds in 3 fathoms water.

DYER'S BAY.—In coming from the eastward, bound to Dyer's Bay, give Titmanan light three-fourths of a mile berth, leaving it on your starboard hand; bring the light to bear N. E., three-fourths of a mile distant, then steer N. by W., which will carry you into the mouth of the bay, leaving a large dry ledge on your larboard hand: when abreast of this ledge, which is bold to, give it a berth of 5 or 6 rods, then steer N. ½ E. 4 or 5 miles, where you may anchor safe from all winds, in 4 or 5 fathoms, muddy bottom.

GOLDSBOROUGH HARBOR lies N. N. W. from Titmanan light-house, two leagues distant, leaving one island, covered with trees, on your starboard hand, and two on your larboard hand; then your course is N. N. W. 1½ mile, then N. ½ E. 4 miles, which will bring you up with Goldsborough Point, where you may anchor safe from all winds, in 3 or 4 fathoms, muddy bottom.

PROSPECT HARBOR.—In coming from the eastward, bound to Prospect Harbor, give Titmanan light a berth of three-fourths of a mile, bring it to bear E. S. E., and steer W. N. W. 4 leagues, which will bring you up with the western shore, or Birch Head Harbor. In running the above course, you will leave Cranberry Rock point on your starboard hand, Moulton's Ledge, and the two black ledges on your larboard hand. Your course from Cranberry Rock point in is N. W. by N. In case you should not make the point, continue your course W. N. W. until you make the western shore, giving it a berth of half a mile, then steer N. N. E. until you open the harbor, then steer N. W., which course will carry you safe in. If you fall in with Chuttock Island, and are bound to Prospect, give it a berth of three-fourths of a mile, then steer N. N. E.

which course will carry you safe into the harbor. In running this course, you will leave the two black ledges on your starboard hand, giving them a berth of three-fourths of a mile.

MOUNT DESART TO GOLDSBOROUGH AND MACHIAS.

In going from Mount Desart to Goldsborough, you must steer E. ½ N. for Scuttock Point, four leagues, where there is an island, which you may pass either side of, but it is best to leave it on your larboard hand, and then steer N. E. about 3½ leagues, which will carry you up with Goldsborough Harbor. You will see three islands which lie in the mouth of the harbor; you must leave them on your larboard hand, and go in the eastern passage. In standing in for this place, you will see Titmanan light-house, which you leave on your starboard hand. North from Titmanan, one-eighth of a mile distant, lies a ledge, bare at half tide, which you keep within half a cable's length of when going over the bar, which you pass on your starboard hand, when bound eastward, at which, as you pass the bar, Scuttock Island will be a handspike's length open to the southward of Scuttock Point, but to go over this bar requires a pilot. When near the bar, and up with Titmanan Island, keep E. S. E. one half a mile distant, which will clear a ledge having 9 feet water at low water, that lies E. of the channel going over the bar, one-fourth of a mile distant. There is a bar that runs from the shore to this little island, which is about one league from the land. This bar has 3½ fathoms, at high water, and 9 feet at low water.

MOUNT DESART ROCK.—This rock is 23 miles S. 12 W. from Baker's Island light; on it there is a light-house, 56½ feet above the level of the sea, containing a fixed light.

MOUNT DESART ISLAND.—This island is about 15 miles long, from north to south, and twelve broad; it is nearly divided by a stream of water, called Soames Sound, at the head of which is Eden: at the entrance of Soames Sound are two good harbors, N. E. and S. W. Harbors.

S. W. HARBOR.—This is one of the best harbors on that coast: as many as 400 vessels have been at anchor at one time here: to run in, if coming from the westward, when up with Long Island, steer N. N. E. 6 miles, (leaving the two Duck Islands on your starboard and the three Calf Islands on your larboard hand.) This will bring you up midway between the Great Cranberry Island and Mount Desart; steer up midway, until you open S. W. Harbor, when you may haul in, (keeping nearest to the starboard hand, on account of a ledge on the larboard hand, which runs off half a mile) N. W. or W. N. W., and anchor in 5 or 6 fathoms, muddy bottom, safe from all winds. High water at 12 o'clock; rise of tides 12 feet.

Off the S. W. point of Cranberry Island there is a rock, bearing west, distant three quarters of a mile.

The eastern passage into S. W. harbor is between Bear Island (on which there is a fixed light) and Sutton's Island; after you have passed these run until you get the harbor open, then follow the above directions.

HULL'S COVE, MOUNT DESART.—Bring the light on Baker's Island to bear S. W. by S., and steer N. E. by N. for the Great Porcupine Island, when up with it haul to the westward for Hull's Cove, leaving a dry ledge on your starboard hand; where you may anchor in 3 fathoms, ¼ of a mile from the shore.

BASS HARBOR.—When you leave this harbor, bound to the eastward, steer out S. W. till you bring Bass Harbor Bar to bear S. S. E., then run S. S. E., keeping the larboard hand best on board. This bar has not water enough for a loaded vessel before half tide, having 8½ feet only at low water; but a light vessel may go over at low water, keeping the larboard hand best on board. When you get over this bar, you steer E. by S., till you bring the S. W. entrance of Mount Desart to bear N. E., then you may run N. E., leaving Cranberry Island on your starboard hand. But this passage is shoal at low water, and not fit for loaded vessels to go through; but at full tide there is water enough, keeping the middle of the passage. Continue your course to the N. E. till you pass Cranberry Island; then you may steer E. S. E., and anchor between the two Cranberry Islands, where you will be safe from easterly or S. W. winds. You may lie in from 4 to 7 fathoms, good holding ground.

When you leave this port bound to the eastward, you steer E. by S. till you get up with Baker's Island light, which lies to the eastward of the Cranberry Islands; then you steer E. by N., 4 leagues to Scuttock Island. When you pass said island, and are bound to Goldsborough, you must steer N. E. about 5 leagues, and keep that course till you bring Goldsborough Harbor to bear N. N. W., then you must leave three islands on your larboard and one on your starboard hand, and run into the harbor, where you may lie safe from all winds, and anchor in 5 or 6 fathoms.

CRANBERRY ISLANDS are three islands lying south of N. E. Harbor, Mount Desart, making a good roadstead for all winds but easterly.

BAKER'S ISLAND.—On this island, which is the south-eastern of the Cranberry Islands, there is a light-house, containing a fixed light, 70 feet above the level of the sea. It bears W. S. W., 22 miles distant from Titmanan light.

BLUE HILL BAY.—If you are bound to Blue Hill Bay, or Union River, as soon as you pass Long Island, you will open a large sound to the N. N. W., which course you are to steer seven leagues, when you will be up with Robertson's Island, leaving the Ship and Barge on your larboard hand. Robertson's Island is the only island near that place that has a house on it. The south part of the island is clear of trees, on which the house stands. When you come near the south part of the island give it a berth of three-quarters of a mile, as there are several sunken rocks off said point. When you bring this island to bear from S. W. to N. W. you may anchor in 6 or 7 fathoms water, muddy bottom; but if you are bound to Blue Hill Bay, you may stand to the northward direct for the Blue Hills, which you may see 10 or 15 leagues off. If you are bound for Union River, you had better take a pilot at Robertson's Island, for it is not fit for a stranger to go without one.

ISLE-AU-HAUT.—The Isle-au-haut is remarkable land, composed of high steep cliffs, and makes with a large bay on each side of it; has good landing on its eastern end, and anchorage half a mile off, in 18 fathoms, with the low point bearing about N. E. by N., where is also a stream of water running into the sea. The highest part of the island is in the middle, and represents a saddle.

SADDLE BACK LEDGE.—On this ledge, which lies west of the Isle-au-haut, there is a light-house, containing a fixed light.

MATINICUS ISLAND, at the mouth of Penobscot Bay. On the rock south of this island there are two fixed lights 82 feet above the level of the sea, attached to a dwelling house, 40 feet apart, bearing N. N. W. and S. S. E. from one another.

PENOBSCOT BAY AND RIVER.—This extensive bay is included between Sedgwick Point, on the east, and White Head on the west; the distance between these points is about 11 leagues; and it therefore includes the Isle-au-haut, Deer Island, the Fox Island, Long Island, and a number of small isles, rocks, and ledges. Through the bay to the mouth of the river of its name, the western channel is by the headland on the west, called Owl's Head, on which there is a light-house containing a fixed light, 147 feet above the level of the sea: thence, by Camden on the west, and Cape Rosarie on the east, to Bagaduce Point or Castine River. The eastern channel is between Isle-au-haut on the west, and the smaller isles on the east, through a channel called Long Reach, formed by the shore of Sedgwick on one side, and Deer Island on the other, until it unites with the main channel between Cape Rosarie and Long Island. Above this, on the east, stands Fort Castine, near to which is the town of Castine, opposite to Penobscot. Castine is the port of entry. This noble river, which empties its waters into the bay, and which is now decorated with numerous townships, is the most considerable in the State of Maine, and has its sources about 130 miles above the inlet of Castine. The head of tide and navigation is, however, at Bangor, about 30 miles from the same; but vessels of 30 tons may approach within a mile of this place. At the entrance of the river is a depth of 10 fathoms.

PENOBSCOT RIVER.—From Seguine to Manheigen, the course is east; but you must not bring Seguine to bear W. until you have passed Bantam Ledge, as it bears E., about 4 miles from Seguine. Manheigen is good land to run for, being bold. There are several high rocks on the N. W. side, but they are also bold. From thence to White Head, the course is N. E., leaving George's and Mosquito Islands on the larboard, and Matinac on your starboard hand. The latter is foul. There are two rocks off George's Islands, called the Old Man and Old Woman, with a passage between them. The first lies more than a mile off. When you can see Mosquito Island to the eastward of George's, you are clear of them. There is a ledge between George's Island and Mosquito Island, called Scilly; and also another about one-third of the way from Matinac to Manheigen, called the Roaring Bull, which latter bears about N. E. ½ E. from Manheigen; but you have a clear bay until you come near White Head. There is a ledge S. by E. ½ a mile from the head, and several near the land to the westward. The head is very bold. When a little inside the head, haul up nearly for the N. E. point of a large white island, with trees on it, on the larboard hand, to avoid a ledge called the Gangway Ledge. It lies directly off the mouth of Seal Harbor, and about N. E. from the light. The course from White Head to the point of Ash Island is N. E. The point of Ash Island is bold at low water, but at high water some of the rocks are covered. There is a sunken ledge off this point, the kelps on which are seen at low water, called also Gangway Ledge, which you leave on the starboard hand. Thence to Owl's Head about N. N. E. The course from Owl's Head to Castine is N. E. by N., passing close to Mark Island, which is the first you come to, and leaving several small islands and ledges on the starboard hand; Mark Island on the larboard. The passage is here rather narrow, but with a fair wind there is no danger. The bay, however, is not so clear to the eastward as to the westward of Long Island. From Owl's Head to Camden the course is N. by E. 10 miles, leaving

a high rock called the Graves on your starboard, and Negro Island, on which there is a light-house, on your larboard hand. There are some sunken rocks between the Graves and the northern point of the harbor, nearest the latter, which are on the starboard hand. From Owl's Head up the bay the course is N. N. E. easterly, to Spruce Head, in Northport, 7 leagues. You pass a good harbor on Long Island side, called Gilkey Harbor. It is easy of access, but is bad to find in the night, the land back being higher than that in front of the harbor. Here a light-house is much needed, as it is the best harbor in the whole bay. It lies directly opposite Ducktrap. From Spruce Head to Old Fort Point the course is N. E. 5 leagues, leaving Belfast and Cape Jellison Harbors on the larboard hand. If you wish to harbor in Cape Jellison, you enter with Brigadier Island on the larboard hand, keeping it nearest aboard, as there is a long ledge makes off from Squaw Point on the starboard hand. which is covered at high water. There is a ledge off Fort Point in a southerly direction, called Fort Point Ledge, a half a mile or more. It lies S. S. E. and N. N. W., and is bare at half tide. There are two buoys, one off each end of it. There is a light-house on the point, near which it is so bold that there is a good channel between that and the ledge for beating. The extreme point, however, to the eastward of the light is shoal, and you must give it a good berth. When you have turned this point, you have an excellent harbor on the larboard hand, called Fort Point Cove. There is one small rock near Sandy Point, on which there are about 7 feet at low water, near which there is a log buoy placed. From Fort Point to Bucksport Narrows, the course is north, 5 miles. Above Sandy Point lies Odom's Ledge, which is nearly covered at high water. You may go either side of it, but the eastern is the best channel. When you open Bucksport village, your course is N. E. $\frac{3}{4}$ of a mile, when you will open Marsh Bay N W., at the head of which is Frankfort village, 5 miles. Run up midway till you come near Marsh River, on the larboard hand. The point on the opposite side of the bay is called Drachm Point, from which a flat extends $\frac{2}{3}$ the distance across to Marsh River, on the end of which a buoy is placed. Should you not see the buoy, shut Pickard's Point on McKenzie's Point a handspike's length, and run until you fairly open the reach to Oak Point; Pickard's Point is the land on the S. E. side of Marsh River, and McKenzie's Point is the first point on the starboard hand above Bucksport village. From Marsh River to Oak Point, the course is N. E., 5 miles, good anchorage all the way. Thence to Hinckley's, E. by N., $\frac{1}{3}$ of a mile. Thence to Mill Creek, N. by E., 1 mile, leaving Buck's Ledge, on which there is a spire and ball, on the starboard hand. Thence to Bald Hill, N. W. by W., $1\frac{1}{2}$ mile. Thence to Higgin's, N. N. E., $\frac{1}{4}$ mile. Thence to Bragdor's Castle, N. E., $\frac{3}{4}$ of a mile. Thence to Crosby's, N. N. E., 2 miles. Thence through Crosby's Narrows, N. E., $\frac{1}{2}$ mile. Thence to Crosby's Old Wharf, N. N. E., $\frac{1}{3}$ mile. Thence to Brewer village, E. N. E., 2 miles. Thence to Mitchel's Steam Mill, N. E. by N., $\frac{1}{4}$ mile. Thence to High Head, N. E., $\frac{3}{4}$ mile. Thence to Bangor, N. E. by N., $\frac{3}{4}$ of a mile.

FOX ISLAND PASSAGE.—On Brown's Head, at the western entrance of Fox Island thoroughfare, a light, showing a fixed light, is erected on the Southern Fox Island, and stands two rods from the shore, and 80 feet above high water mark.

The following are the results of observations by compass: Fiddler's Ledge bears from the light, W. $\frac{1}{4}$ S., distant about 3 miles; Fiddler's Ledge from Crabtree's Point W. S. W., distant about half a mile. Fiddler's Ledge is above the surface of the water at two hours ebb.

Crabtree's Ledge bears from the light W. by S., distant about $1\frac{1}{2}$ mile; Crabtree's Ledge bears from Crabtree's Point S. W. by S., distant about half a mile. This ledge may be seen breaking at high water with a little motion.

Inner Dog Fish Ledge bears from the light S. W., distant about 3 miles; Inner Dog Fish Ledge bears from Crabtree's Ledge S. S. E., distant about $1\frac{1}{2}$ mile.

In running from Owl's Head light for Fox Island thoroughfare, bring the light to bear W., and steer E. $\frac{1}{2}$ S., until you bring the light on Brown's Head to bear E. N. E., and then steer for it until you are within one cable's length from the light. In running this course, you pass between Crabtree's Ledge and Dog Fish Ledge, leaving Crabtree's Ledge on the larboard hand, and Dog Fish Ledge on the starboard, which is separated by a channel $1\frac{1}{2}$ mile broad; you may then run half a cable's length of either of them. When abreast of the light, and between the light and Sugar Loaves, steer N. E. $\frac{1}{2}$ E. for Young's Narrows. The Sugar Loaves are two high rocks, formed somewhat like sugar loaves, and are located nearly in the centre of the passage. There is good anchorage between the Sugar Loaves and light, in $7\frac{1}{2}$ fathoms, at low water.

The entrance to Young's Point is narrow at low water, off which lies a ledge of rocks, which are covered at high water. There is also a quantity of sunken rocks at the larboard hand, near a mile to the W. N. W., which lie off the Dumplins. These Dumplins are three islands, which you leave on your larboard hand. Your course in this passage is E. S. E. and W. N. W., keeping your starboard hand on board. When you pass this point on your starboard hand, you must keep your starboard hand on board, and steer E. S. E. about two miles, when you will make Deep Cove on your starboard hand, which

lies to the eastward of a very high bluff of rocks. If you have neither cables nor anchors, you may run into said cove, or secure your vessel with the main or fore sheet, or come to anchor in 7 fathoms water off the said cove. There the flood meets, one from the W. N. W., the other from the E. N. E., which makes an eddy against this cove and highland; here you may ride safe with any wind. When you leave this place, and are bound to the eastward, you steer E. S. E., and keep your starboard hand on board till you come up to a clear spot of land, where the trees have been cut off. As soon as said spot bears W. S. W., you steer E. N. E. for the middle narrows. When you draw near the narrows, you will see two large white rocks in the middle of the passage, unless at high water, at which time they are covered about one hour, but may be seen at all other times of tide. You may go on either side, but the deepest water is at the southward of them. Continue your course E. N. E. about one league, when you must keep your starboard hand on board, as there are several sunken rocks and ledges on your larboard hand, which are covered at high water. You will make the eastern narrows on your starboard hand, and as soon as you bring it to bear S. S. E., you may run through, where you will have a fine harbor, which is safe to ride in with all winds, except at E. N. E., but you may remain in the west passage with the wind at E. N. E., or anchor at the northward of a bare island, that you will see on your starboard hand as you go back to the westward. When you pass the eastern passage of Fox Island, you must steer E. N. E., about 4 miles, which course will carry you into a large bay that lies between Fox Island and the Isle-au-haut. This bay lies N. and S., and about 4 leagues E. and W. When you get into this bay from the above mentioned passage, and are bound to the eastward of the Isle-au-haut, you may steer E. S. E., 6 leagues, which course will carry you to the southward of the Isle-au-haut.

CAMDEN HARBOR.—North-east Ledges bear from the light on Negro Island, at the mouth of Camden Harbor, N. E. $\frac{1}{4}$ N., distant about three-eighths of a mile. North-east Ledges to Morse's Point, N. by W., distant about half a mile; those ledges are covered at high water, but are above the surface of the water at two hours ebb. Barrit's Point forms the western side of Camden Harbor, and bears from the light S. W. by S. $\frac{1}{2}$ S., distant about three-eighths of a mile. Morse's Point lies opposite the light-house and forms the eastern side of the harbor. Barrit's Point to the Graves, S. E. $\frac{1}{2}$ S., distant about $1\frac{1}{4}$ mile. From the light to the Graves, S. by E. $\frac{1}{2}$ E., distant about 2 miles. Owl's Head light bears from Camden light S. $\frac{1}{2}$ W., distant about 12 miles. From the Graves to the Owl's Head light S. by W. $\frac{1}{2}$ W., distant about 10 miles.

Camden light-house is situated on the S. E. part of Negro Island, and contains a fixed light, elevated 49 feet above the level of the sea.

In coming from the westward, and bound to Camden Harbor, bring Owl's Head light to bear south, and steer N. $\frac{1}{2}$ E. for Camden light, leaving the Graves and North-east rocks on the starboard hand: the Grave is a small black rock, and is above the surface of the water at all times, and you may near it within a cable's length, on all sides. When up with the light-house leave it on the larboard hand one cable's length, and steer N. W. by N. $\frac{1}{2}$ N., or N. N. W., distance nearly half a mile, and anchor near the north shore, in from four to five fathoms water, good holding ground. If you are to the eastward and bound for Camden Harbor, bring the light to bear W. S. W., or S. W. by W., to clear the North-east Ledges, then follow the above directions.

CASTINE LIGHT-HOUSE is on Dice's Head, at the entrance of Castine Harbor. It is a fixed light, 116 feet above the level of the sea, N. W. $\frac{1}{2}$ W. from Fort Point ledges, and from the eastern end of Long Island S. E. by E. $\frac{1}{2}$ E. The shore near the light-house is bold.

CASTINE.—The beacon on Otter Rock bears from the light-house on Dice's Head, at the entrance of Castine Harbor, S. E. $\frac{1}{4}$ E., distant half a mile; Noddle's Island Point, S. E. $\frac{1}{2}$ S., distant about $1\frac{3}{4}$ mile; Bull Head, on Holbrook's Island, south, distant about 2 miles; Turtle Head, W. N. W., distant about $4\frac{1}{2}$ miles; Belfast, N. W. by W., distant about 11 miles. From the Beacon on Otter Rock to Noddle's Island Point, S. E. by S. $\frac{3}{4}$ S., distant about three-eighths of a mile; from Noddle's Island Point to the beacon on Hosmar's Ledge, E. N. E., distant about three-quarters of a mile; from Otter Rock Beacon to the beacon on Hosmar's Ledge, E., distant about three quarters of a mile; Hosmar's Ledge Beacon to the town of Castine, N. N. E., distant about half a mile.

Otter Rock is a small round rock, and lies about 2 cables' length from the northern shore, and has on it an iron beacon, with a cask placed upon a staff at its centre, and is about 12 feet above the level of the sea at high water. Noddle's Island Point is a low black rock, and very bold. Bull Head is a high bluff of rocks, and of a yellowish cast, and lies on the south side, without the entrance of the harbor.

Hosmar's Rock lies about one-eighth of a mile from the southern shore of Castine Harbor, and has on it an iron beacon, as described on Otter Rock. Turtle Head is the northern head of Long Island. Stubbs' Point Ledge lies opposite the town, but is not

in the way of vessels going into Castine Harbor, on which there is a beacon to be erected this season.

If you are bound up Penobscot Bay, and are to the eastward of Long Island, and intend going into Castine Harbor, bring the light on Dice's Head to bear N. E. by N., and run for it until you are within a half a mile of it, then steer E. by N. for the beacon on Hosmar's Ledge, leaving Otter Rock Beacon on the larboard hand, one cable's length distant, and Bull Head, Noddle's Point, and the beacon on Hosmar's Ledge on the starboard hand; you may near the starboard shore off the entrance of Castine Harbor, within one cable's length, and steer E. N. E., which will carry you in ship channel way. You may anchor off the town, near the wharves, in from 8 to 10 fathoms water.

This harbor is easy of access, and vessels may approach it with safety by following the above directions.

WHITE HEAD.—Vessels bound from the southward, and intending to fall in with White Head light-house, should endeavor to take their departure from the high land of Cape Cod, from which to Manheigen light, the course is N. N. E. $\frac{1}{4}$ E., distant thirty-five and a half leagues. The shore near Manheigen is bold, with good water on all sides, having no shoals or sunken rocks about it; there are some dry islands and ledges on the north side, but they are bold, and good water all among them. From Manheigen light to White Head light, the course is N. E., distant about seven leagues, with a fair open sound. There is a small ledge lies about half a mile from White Head light, bearing S. by E., which is just out of water at common tides: at low water you pass between this ledge and the light to go in the Muscle Ridge Channel, or into the harbor. You continue your course N. E. by the light about three-quarters of a mile, when you will open the harbor on your larboard hand, between a small ledgy island near the light, and a high white island with some spruce trees on it. When you open the harbor N. W. you steer N. W., and sail on till you pass all the ledges on your larboard hand, and anchor in about 5 or 6 fathoms, good holding ground.

White Head light is built on White Head Island, remarkable for the many white rocks on the head. It is 7 leagues from Manheigen, bearing N. E.; is a fixed white light, 58 feet above the level of the sea. Attached to this light is a bell weighing 1000 lbs., striking, in foggy weather, three times a minute. The light is small, but of great importance, as all vessels bound to Penobscot Bay, going in shore, are obliged to pass by the light through the Muscle Ridges. A stranger wishing to pass this light must, if coming from the westward, run in for the land east of Manheigen, until the light bears S. W.; then steer N. E., and you can pass within half a cable's length of the head.

Vessels of 60 or 70 tons may double close around the head of the light, soon as it bears N. E., and anchor right abreast of the store. This is called Sail Harbor. Vessels taken with calm and ebb tide, may anchor any where off the light, in from 12 to 20 fathoms water. If the wind takes you at N. E., and ebb tide, that you cannot get into Sail Harbor, you may run into Tarrent Harbor, which bears W. by S., about 4 miles distant. You will continue your W. by S. course till the first house on the starboard hand bears N. N. W., when you may anchor in about 4 or 5 fathoms water, good ground.

SAIL HARBOR lies to the northward and eastward of White Head about three-fourths of a mile. If you wish to go into this harbor, haul up round the Head, within about a cable and a half's length, run until the light bears S. W., then steer N. by W., run in and anchor in 8 fathoms, sticky bottom. This is a good harbor in winter.

TARRENT HARBOR, MUSCLE RIDGE, AND PENOBSCOT BAY.—In sailing from this harbor, you may steer east one league, to White Head light, but be careful not to haul in for it till it bears N. E., as there is a large ledge of rocks bearing about W. N. W. from said Head, one mile distant, but within it, a pistol shot from the shore, is safe navigation. In going in, you must give the larboard hand a berth, as there is a sunken ledge, which extends about two-thirds across the mouth of the harbor, that breaks when there is any sea, unless at high water.

Your course from White Head light is N. E. to Ash Point or Island, one league distant, which has a large rock to the S. W. of it, about half a mile distant, which you must leave on your larboard hand. It is not in the way except you are obliged to go about. When you haul round this island, give it a small berth, and steer N. N. E. or N. E. by N. for the Owl's Head, leaving two islands on your starboard hand; but when you draw near the larboard shore, you steer about E. N. E. for the Owl's Head, which has a good harbor on the larboard hand as you go to the eastward. This harbor makes with a deep cove. You may bring a rocky point that lies on your starboard hand to bear N. E., and a ledge of rocks that lies without said point to bear E. N. E., and anchor in 4 fathoms, muddy bottom.

This harbor is open to the wind at E. by N. and E. N. E., but in all other winds you are safe. The tide of flood sets to the eastward, and the tide of ebb S. W. through the Muscle Ridges.

If it is night when you come to White Head light, you had better not attempt going

through the Muscle Ridges. Your best way is to go by Two Bush Island, which you must leave on your larboard hand, keeping your course E. N. E. or N. E. by E. [Two Bush Island is round and barren, but has only one bush on it. Formerly it had two bushes.]

If you are in a large vessel, your best way is to go in this passage, as it is the most safe. You must follow your course, as above directed, about two leagues, when you will have Penobscot Bay open, and then you may direct your course to either side of Long Island. If you go to the westward, your course is N. N E. to Great Spruce Head, which having passed seven leagues, your course is N. E. by N. 5 leagues to Old Fort Point. In steering said course, you will leave Belfast Bay and Brigadier's Island on your larboard hand, which island has a good harbor, and if you mean to go into it, you must leave it on your larboard hand, and steer in about N. or N. by W.

You may run up above this island, and anchor on the starboard hand, if the wind is to the eastward; but if to the westward, or S. W. you must not. There is a bar that lies from this island to the main land, which is covered at high water. There is also a good harbor to the westward of this island, called Long Cove. If you turn into either of these harbors, you must be careful of some rocks that lie to the southward of this island, more than half a mile from the main land. But in going to Penobscot, proceed as above, and keep your larboard hand on board. When you pass this island for the Old Fort Point, which has no trees on it, you must observe before you come to it, that a large ledge of rocks lies about three-quarters of a mile to the E. S. E. of it, which is covered at high water, but bare at half tide. You may go within a cable's length of Old Fort Point, in smooth water. These rocks may be discovered when the wind blows.

If you are bound up Penobscot, from Old Fort Point, with the tide of ebb, and the wind a-head, you may make a good harbor in the east river, which lies about E. N. E. from Old Fort Point, about one league. This river lies to the south-westward of Orphan Island, in which place you will lie safe from all winds, and anchor in six or seven fathoms, good holding ground.

On Old Fort Point, above Castine, there is a light-house, to indicate the direction to Prospect Harbor.

Orphan Island is a large island, which you are to leave on your starboard hand, and sundry rocks on your larboard hand, which are above water. When you pass Orphan Island, you may anchor to the N. W. of it on the starboard hand, as you go through; but if wind and tide are in favor you may proceed up to Marsh Bay, keeping the larboard hand best on board. Marsh Bay is about two leagues from Orphan Island. When you pass Marsh Bay, you may keep in the middle of the river, and you have neither rocks nor shoals until you get up to the falls. You have no particular course in going up this river, but may sometimes go to the westward of N. and sometimes to the eastward of N.

When you enter Penobscot Bay, and are bound to the eastward of Long Island, you must steer N. E. by N., leaving Long Island on your larboard hand, which course will carry you up to Castine. If you intend going into this harbor, as soon as it bears E. N. E. you may run in it, steering E. N. E., keeping the middle of the channel until you pass the first island, giving it a berth of half a mile; then haul to the southward until the island bears W. S. W., when you may anchor in 8 or 10 fathoms, muddy bottom, and lie safe from all wind.

In going into the harbor of Castine, you leave three islands on your starboard hand; but if you are bound up Penobscot River, you must steer north, leaving the ledge of rocks off the Old Fort Point on your larboard hand: then follow the same direction you have for running into the Penobscot River, which will carry you up to the falls. The tide ebbs and flows, at full and change, about 10 or 11 feet.

MANHEIGEN LIGHT.—On Manheigen Island, south of the entrance to George's River, is a revolving light, alternately red and white; time of revolution 2′ 15″, elevation 170 feet above the level of the sea. You can run close to the island on either side, taking care to go between some dry ledges on the northern side of it. In the island there is a small harbor, open to the S. W.; it bears E. N. E. from Seguine light.

FRANKLIN ISLAND LIGHT, is on the north end of Franklin Island, which is on the eastern side of the entrance to George's River, is a fixed light, 50 feet above the level of the sea.

PENMEQUID POINT LIGHT, on the western side of the entrance to George's River. A light-house, containing a fixed light, is erected on this point, 30 feet high, and 75 feet above the level of the sea. It is a light to Bristol and Waldoborough Rivers; bears N. W. ½ W. from Manheigen light, distant 12 miles.

GEORGE'S RIVER.—Bring the North Damiscove Island, which is called White Island, (from its being white,) to bear W. S. W., and steer E. N. E. for Franklin light-house, that you leave on your starboard hand, and which you may pass within a cable's length of. When abreast of Franklin Island light, (which is on your starboard hand,) steer N. E. for Otter Island, 4 miles distant, and continue until within one-quarter of a mile of it, leaving it on your larboard hand; then steer E. N. E. for Cauldwell's Island,

at the S. W. end of which is a high round rock, called Goose Rock. When abreast of said rock, which you may pass within one cable's length of, leaving it on your starboard hand, steer N. E. by E. and N. E., keeping Cauldwell's Island best on board, to avoid a ledge in the middle of the river.

In beating into George's River, you must be careful of a sunken ledge which bears E. N. E. from Franklin Island light, 6 miles distant; also of a ledge off the S. E. end of Gay's Island, which extends one-third of the way across to Goose Rock.

Should you fall in with Manheigen Island light, and bound to George's River, you may steer N. N. W., leaving Manheigen Island on your starboard hand, until Franklin Island light bears N. E. by E., when you may run for it, and steer as above directed. Franklin light may with safety be run for when bearing from N. E. by N. to E. N. E.

In running from White Islands for George's River, be careful of New Harbor Ledges, which bear E. N. E. from Penmequid Point light, one league distant, on which are 5 feet water at low water. After passing these ledges, you will see a large dry rock, called the Western Egg Rock, which bears E. N. E. from Penmequid Point, two leagues distant, and W. by S. from Franklin light, one league, which you leave on your larboard hand; you will also see the eastern Egg Rock, which bears south from Franklin light, one league distant, which you leave on your starboard hand. These Egg Rocks bear E. S. E. and W. N. W. from each other, one league distant, and their appearance much alike, which you pass between, with a clear and open channel. You may distinguish one from the other by their bearings from the light.

Should you have the wind ahead, and be obliged to turn to windward, you may stand to the northward until Franklin Island light bears E. N. E., and to the south-eastward until it bears N. N. E., without danger.

To the northward of the range of Penmequid Point and the Western Egg Rock, and M'Cobb's Island, the ground is foul and rocky; and also to the eastward of the range of Franklin Island light, and the Eastern Egg Rock. [NOTE.—M'Cobb's Island is the western entrance of George's River, and bears N. W. 1¼ mile distant from Franklin Island light.]

JOHN'S BAY HARBOR.—John's Island bears from Thrum Cap Island N. N. E., distant about three miles. Thrum Cap Island is a small bare island, and forms the western side of the entrance of John's Bay, bearing from Penmequid Point W. S. W., distant about two and a half miles. Penmequid Point forms the eastern side of the bay, and is a low bare point; but the shores are bold on all sides. The light-house is situated on the S. E. side of Penmequid, and bears from the western point E. N. E., distant about half a mile; from John's Island to Butford's Island, west, distant about one mile; Stuart's Island, N. W. by W., distant about one mile; High Island Head, N. ¾ W., distant about two miles; McFarling's Point, N. W. by N., distant about one and a half mile—one-eighth of a mile from McFarling's Point there are several ledges, covered at high water, but are not in the way of vessels running into this bay, as they lie so near the western shore they may be seen at all times, with a little motion of sea;—McCown's Point from John's Island, north, distant about one and a quarter mile; Penmequid Point, S by E., distant about three miles; Penmequid's Harbor, N. E., distant about half a mile. Thrum Cap Island bears from White Island N. E., distant about two miles. High Island Head is a high bluff covered with trees, and you may near it within 200 feet of the shore.

John's Island is small and high, covered with spruce trees, located near the centre of the bay, and has a house on the N. W. part of it, which cannot be seen until you are up with the island; if you wish to run into Penmequid Harbor, you may go to the eastward of John's Island, leaving two dry rocks on the starboard hand, keeping them close on board; or you may leave them on your larboard hand, and after passing them you will see the entrance of the harbor, bearing about N. E., half a mile distant, where you may run in, and lie safe from all winds.

Vessels westward bound, and falling in with Manheigen Island, and wish to make a harbor in a strong S. W. wind, must observe the following directions:—Bring Manheigen light to bear S. E., and steer N. W., distant about 11 miles, for Penmequid Point; and when the light on said point bears E. N. E., distant half a mile, you are then up with the western point of Penmequid; leave it on your starboard hand, and give it a berth of one-eighth of a mile, then steer north for John's Bay Harbor, leaving John's Island, McCoun"s Point, on your starboard hand; Butford's Island, Stuart's Island, and McFarling's Point on the larboard hand. If you are from the westward, and bound into this harbor, you may bring John's Island to bear N. by E. and run until you are within one cable's length of it; then steer north for High Island Head, which you leave on your larboard hand, and when abreast of said head steer N. ¼ E. about three-eighths of a mile, and anchor in from 4 to 5 fathoms water, good holding ground. John's Bay lies about 5 miles to the eastward of Townsend Harbor, and is a fair open bay, having no rocks or shoals at its entrance, and vessels may run in without fear, by following the above directions.

DAMARISCOTTA RIVER.—The buoy at the mouth of Damariscotta River, and

the bearings of different objects about it, and directions for the river:—Hern Island, S. W. part, bears from the buoy, E. by N., distant about a quarter of a mile; White Island, S. ½ W., distant 2¾ miles; Varnum's Point, north, distant about 3½ miles; Foster's Point, N. by E., distant about 2½ miles; from Hern Island to White Island, S. S. W., distant about 3 miles. Hern Island forms the eastern side of the entrance of Damariscotta River, and is high, covered with spruce trees. Varnum's Point is a high bluff point, and is on the western side of the river, and is also covered with trees. The shores on both sides of the river are bold.

In coming from the westward, and bound to Damariscotta River, bring White Island to bear S. ½ W., and steer north, leaving the buoy, Hern Island, and Foster's Point on the starboard hand; give the buoy a berth of a cable's length, and steer N. by E., keeping in the middle of the river, and when up with Varnum's Point, which you leave on your larboard hand, you will see Hodgden's mills on the western side of the river, about 1½ mile. Hodgden's house and mills are painted red; you may anchor abreast of them, near the middle of the river, in 5 fathoms water, good holding ground, where you may lie safe from all winds. The above mentioned buoy is a spar buoy, painted red, elevated about 12 feet above the surface of the water, and is moored about 100 feet to the westward of the ledge, in 6 fathoms, at low water.

Should you fall in to the eastward of Seguine, and wishing to go outside of Damiscove Islands, bring Seguine light to bear E ½ N., and steer E. ½ S., 5 leagues distant, to clear Bantam Ledge, which lies east from Seguine 3½ leagues distant, and S. S. W. from Pumpkin Rock, one league: you then steer N. E. until you make Franklin light, and then steer as above directed, or continue your E. ½ S. course until Pumpkin Rock bears north, then steer N. E. for Franklin Light. Your course from Pumpkin Rock to Franklin light is N. E. by E., 5 leagues distant. In hazy weather you will do well to get a departure from this rock, as you cannot see Franklin light more than 4 miles distant. You may anchor in Gay's Cove, taking care to avoid a sunken ledge which lies E. from Gay's Cove, near the middle of the channel, and has 4 feet at low water. This ledge must be left on your larboard hand, keeping Cauldwell's Island close on board. Gay's Cove lies on you larboard hand about 8 miles to the E. N. E. of Franklin's Island light. You may know this Cove, as Gay's house and barn lie to the N. W. of it. But if you are bound through Herring Gut, bring Capt. Henderson's house to bear N. N. W., and steer S. S. E. for Herring Gut. This Herring Gut has a bar from side to side, but you may go over it at two hours flood, keeping your larboard hand best on board. As you come on the bar, you will see a large rock on your starboard hand, and the deepest water is within a cable's length of the rock; your course over the bar is S. S. E. You may anchor to the N. W. of the bar in 4 or 5 fathoms, muddy bottom, and wait for the tide. The tide of flood sets to the northward, and the ebb to the southward.

SEGUINE LIGHT-HOUSE is situated on an island near the mouth of Kennebeck River, 200 feet above the level of the sea, and contains a fixed light. Cape Small Point bears N. W. from it, and Wood Island N. N. W., 1¾ mile distant. There are several rocky ledges near Seguine, which bear from the light as follows: 5 fathoms ledge S. by W., distant three quarters of a mile; Ellingwood's Rock north, one quarter of a mile; Seguine Ledges N. N. E., half a mile, always dry; Jack-knife Ledge N. W., 1¼ mile, 8 feet water; Wood Island Reef N. N. W., 1⅛ mile, 4 feet water; Whale's Back N. N. E., 1¾ mile.

MARSHALL'S POINT.—On Marshall's Point, at the eastern entrance of Herring Gut, there is a fixed light, elevated 30 feet above the level of the sea.

HERRING GUT HARBOR.—Old Cilly bears from the light on Marshall's Point, at the entrance of Herring Gut Harbor, S., distant about 3 miles; Black Rock, S. ½ W., distant about 1½ mile; Henderson Island, S. S. W., distant 1 mile; Bradford's Island, W. by S., distant half a mile; Gunning Rock, S. E. by S. ¾ S., distant about 1 mile; Two Brothers, S. E., distant about 2½ miles; Henderson Island from Gunning Rock, W., distant about half a mile; Gunning Rock to Black Rock, S. W. ½ S. distant about half a mile. S. E. by S. ½ S. from Gunning Rock, distant a quarter of a mile, lies a sunken ledge, which can be seen breaking at low water in a heavy sea. From Old Cilly to the light on Manheigen Island, S. W. by S., distant about 9 miles; Musquito Island from Old Cilly, N. E. by E., distant about 4 miles; Green Island from the Brothers, S. E. ¼ S., distant about a quarter of a mile. Old Cilly is a low black rock, and can always be seen above the surface of the water. A reef extends off east, distant nearly a quarter of a mile, which must be avoided. Black Rock is a small round rock, and is also above the surface of the water. Henderson Island is a small low island, with no bushes or trees on it. Bradford Island is high, and covered with spruce trees, and forms the western side of Herring Gut Harbor. Green Island is also a small bare island. The two islands called the Brothers, are small, and covered with spruce trees. Gunning Rock is high and bare, with a yellowish color: this ledge is very bold, and you may near it within 100 feet.

Sailing Directions.—In running from Manheigen for Herring Gut Harbor, bring the

light on Manheigen to bear S. W., and steer N. E. by N., and when the light on Marshall's Point bears N. by W. ½ W., then run for it: in running for the light you will leave the Old Cilly, Black Rock, and Henderson Island on the larboard hand; Musquito Island, Green Island, Two Brothers, and Gunning Rock, on your starboard hand. Give the light a berth of two cables' length, and when it bears east of you, steer N. N. E., distant about one mile, and anchor in from 4 to 5 fathoms, where you lie safe from all winds; you will find good anchorage any where between Marshall's Point and Bradford's Island.

You may run into this harbor by bringing the light on Marshall's Point to bear W. N. W., leaving the Green Island, Two Brothers, and Gunning Rock on the larboard hand; Musquito Island on the starboard. This passage is full of shoals, and had better not be attempted unless well acquainted.

This harbor is easy of access, and vessels may approach it with safety by following the above directions.

When you go out of this harbor, and bound to the eastward, be careful and give the larboard hand a good berth, for there are two ledges of rocks on the same hand of the eastern point, which are under water, and lie off about a cable's length. When you are clear of these ledges, you may steer E. by S., or E. S. E., one mile to the barren island, which you leave on the larboard hand, and 3 or 4 islands and ledges on the starboard hand. When you pass these ledges and Musquito Islands, if bound to White Head, you may steer N. E. by E. 2 leagues, and when you bring the light to bear N. E., run for it, but when you pass the S. W. White Head, leave it on your larboard hand, and be careful of a sunken rock that lies S. E. from the eastern White Head, about one cable's length distant. Your course through to the eastward is N. E., and to the westward S. W., keeping near the middle of the passage. Before you come up with Ash Point, you must be careful of a sunken rock, which lies off the point about one-third of the passage, which has not more than 8 feet at low water. But if you should go through this passage in the night, keep Potatoe Island, which is right against Ash Island, about S. S. W. from it, and bare of trees, which you leave on your starboard hand, best on board. When you pass Potatoe Island, and are bound into Owl's Head, your course is N. N. E., about 2 miles, which will leave two islands on the starboard hand. When you open the passage to Owl's Head, and bound to Edgemavoggan Reach, your course is N. E. by N., till you pass the Lime Islands, which you leave on your larboard hand. Continue said course till you make a large bare rock on your starboard hand, and a little round island to the eastward on the same hand, which is covered with trees. Continue your course to the N. E., and you will make a large island on your starboard hand; when you pass this island, you have the passage open to Buck's Harbor: continue your course N. E., till you pass by all the islands, to the southward and northward. In the day time you may see Blue Hills, bearing E. N. E., over all the land. This passage is safe to go through with a first rate man-of-war. When you come within two miles of the reach, you will make a small island on your starboard hand, which has a sunken rock to the northward of it. Your safest way is to keep the middle of the passage, as there is a sunken rock (or ledge) on the larboard hand, that lies E. by S. from an island which you leave on your larboard hand, about half a mile distant. If you want to make a harbor, you may go into Buck's Harbor, by a N. E. or N. E. by N. course. When you come into this harbor, (which is 12 leagues from Owl's Head,) you must leave an island covered with young birch trees, on your starboard hand, steering N. N. W., and when you get to the northward of said island, you steer E. S E. till you bring it to bear S. S. W. where you will be land-locked from all winds, in 4 and 5 fathoms, soft bottom. When you leave Buck's Harbor, and bound to the eastward, you steer S. E. till you come to a large rock and four islands, which you leave on your larboard hand, keeping the said rock and islands best on board, for there is a sunken ledge that lies S. S. W. from them. You will make a black island on your starboard hand with burnt trees on it. This ledge lies N. N. E. from said island, near the middle of the passage, but keeping the eastern shore best on board, you will go clear of it. When you have passed this ledge, you leave two islands on your starboard and two or three on your larboard hand. Continue your course to the S. E. till you make two islands, between which and Buck's Harbor the course is S. E. and N. W. 6 leagues. To the eastward you may go between both islands, steering E. by S. 1 league, which course will carry you up with Thrum Cap, which island has a bar of rocks, that lie near half a mile to the northward; but if you have a head wind, and are obliged to run through, you will observe the channel is two miles wide at Channel Rock, which is always above water.

When you leave this Thrum Cap, steer E. by S. which will carry you between the Ship and Barge, and three islands which you leave on your larboard hand, which are covered with large rock-maple trees. The Barge is a bare rock, which you leave on your starboard hand; but there is a rock about a cable's length to the northward of the Barge. Continue your course E. by S. for Bass Harbor, distant from Thrum Cap 5 leagues; but you must have some regard to the tide of ebb, which sets very strong to the S. S. E. and the tide of flood to the N. N. W. If you are bound into Bass Harbor, you keep Rich's

Point within a cable's length, which you leave on your larboard hand, for there is a large ledge of rocks, which lies off about half a mile, which is bare at half tide, and bears S. E. from Rich's Barn, and S. by W. from the entrance of Bass Harbor. You give the larboard hand a good berth in going into Bass Harbor; in entering which you must give both sides a berth, for at low water it is shoal. When you get into this harbor, anchor on the larboard hand, with a cove to the westward of you, in 3 or 4 fathoms, muddy bottom.

TOWNSEND TO MANHEIGEN HARBOR.—When you take your departure from Squirrel Island, you steer E. S. E. for Manheigen light, on the north side of which are some small dry islands and ledges, but good water between them and the other sides of the island, keeping that course until the passage between George's Island and Manheigen bears N. E. You may then steer N. E. about seven leagues, through a fair open sound, for White Head light, leaving George's Islands, (which are three in number,) on your larboard hand. The eastern island has no trees on it. There are two dangerous rocks, bearing due south from the middle of the middle island, called the Old Man and the Old Woman, which are bare before low water. They lie about one mile from the shore; and at high water when the wind blows off the land, they do not appear. If you are bound to the eastward, and the wind should take you ahead, when you are between Manheigen and George's Islands, bring the middle of Manheigen to bear S. and run in N., which course will carry you between the eastern George's Island and the middle island. You may run as near as you wish to the eastern island, but the middle island has a ledge of rocks that lies to the eastward of it, which are always dry, that you are to leave on your larboard hand. When you get to the northward of this island, you must haul to the westward and run up between it and the western island, so as to bring the body of the middle island to bear N. E. of you. Here you moor your vessel, if you stay any time.

If you are bound to the eastward from this island, you may go to the northward of the eastern island, but you must be careful of a ledge that lies to the eastward of said island, which you must leave on your starboard hand; and when you bring Manheigen light to bear S. W. you may go N. E. If night should come on, or the wind ahead, you may haul up about N. E. by N. for Terrant Harbor, which lies about 8 leagues from George's Islands. You cannot miss this harbor in the day-time. You will make Mosquito Harbor, which lies between two islands, covered with spruce trees. The entrance of the harbor is north. Having passed this harbor, you will run about two miles, keeping your course N. E. by N., when you will pass an island with burnt trees on it, which you leave on your larboard hand, and two islands on your starboard hand, which also have burnt trees on them; then you must bring the harbor to bear W. N. W. before you enter. This is a good harbor, provided you have neither cables nor anchors, as you may save your vessel by running up to the head of it, on muddy bottom, which will be dry at low water.

TOWNSEND HARBOR.—The entrance of Townsend is wide; from the Cuckolds to the Damiscove Islands is about three miles; and Squirrel Island lies N. E. by N. about 2½ miles; and from Squirrel Island to the western shore is about 1½ mile; and Burnt Island, on which there is a fixed light, 56 feet above the level of the sea, bears N., distant about two miles from the westerly point of Squirrel Island. Bunting Ledge lies south, a little westerly, from Burnt Island light. If you are outside of Damiscove Islands, be careful to stand so far to the westward as to bring Burnt Island light to bear N. by E.; then you may run for it without fear.

If the wind should be ahead, and you have to beat into the harbor, you may stand from shore to shore without fear, and beat up either to the eastward or westward of Squirrel Island; you may find good anchorage under the lee of Squirrel Island, and go round the island with any vessel.

In coming from the westward, leave Seguine Island on your larboard hand, giving it a berth of about half a mile; then steer N. E. by E. 3 leagues, when you will, if clear weather, open Townsend light, on Burnt Island, bearing about N. N. E., but still continue your N. E. by E. course until Burnt Island light bears N. by E., then stand for it, continuing N. by E., leaving it on the larboard hand till up the harbor. About three-quarters of a mile N. N. E. from the light, there is a small island called Mouse Island, which you leave on your starboard hand, which is bold; after passing it, you haul up N. E. for the eastern harbor, or continue your course N. by E. till you get the western harbor to bear W. N. W., then you may run in till you shut Burnt Island light in by the land; or you may anchor any where inside of Mouse Island, as there are neither rocks nor shoals lying off from the land.

In coming from the eastward, get Manheigen light to bear E. S. E. and steer W. N. W. about 5 leagues, which course and distance will carry you into the passage between all the outer islands and the main; and in steering said course, you will make Burnt Island light, bearing about N. W. by W., then steer W. by N., till you get Burnt Island light to bear N. W., then haul up for it, keeping it on your larboard bow, till you get

up with it, then steer N. by E., and follow the directions before given in coming from the westward,

KENNEBECK.—If coming into Kennebeck River from the westward, keep about one-fourth of a mile from Seguine Island light, in doing which you will avoid Jack-knife Ledge, which bears from Seguine light N. W., distant 1¼ mile, and Ellingwood's Rock, lying N., one-fourth of a mile from Seguine. After passing Ellingwood's Rock, bring Seguine light to bear S., and steer N. for Pond Island light, which is a fixed light, 52 feet above the level of the sea, and bearing N. ¼ W. from Seguine light, distant 2¾ miles. Leaving Pond Island a cable's length on the larboard hand, care should be taken on the flood tide to haul quickly round Pond Island Point, to avoid the Sugar Loaves, (two small islands N. ½ mile from Pond Island,) upon which the tide sets very strongly. The course after passing Pond Island is about N. W. to the fort on Hunnewell's Point, (which you will give a berth of a cable's length,) and steer north for Coxe's Head, (on which also is a fort,) one mile. The course is then N. E. to Perkin's Island, which you will leave on the starboard hand, about one mile, and you will give it a berth of a cable's length to shun two sunken ledges that lie nearly abreast of Perkin's Island, and about in the middle of the river; then steering about north one mile, you will have fine anchorage at Perkin's Flats, in 4, 5, and 6 fathoms. This is as far as it would be prudent for a stranger to attempt with a heavy vessel.

There is good anchorage in moderate weather any where between Seguine and Pond Island, within half a mile of the latter, in from 5 to 8 fathoms. Should the wind blow violently, or in case of stress of weather, and if far enough to windward to weather Ellingwood's Rock and Seguine Ledges, it might sometimes be advisable to run to Townsend Harbor.

If bound into Kennebeck, and falling to the eastward of Seguine, bring the light on Pond Island to bear N. W. by W., and run for it till within a cable's length, then follow the preceding directions.

There is safe anchorage, with an off-shore wind, any where between Small Point and Seguine, avoiding Jack-knife Ledge, before mentioned.

Safe anchorage may be had from Coxe's Head to Perkin's Island, nearest the eastern shore. The usual rapidity of the tide, between Seguine and the mouth of the river, is 3 and 4 knots.

There is also a passage into Kennebeck River, leaving Pond Island on the starboard hand, but only 16 feet can be carried at high water, and it is not recommended.

You have deep water to the eastward of Seguine. At the westward the tide of flood sets strong to the northward into New Meadows, and W. N. W. into Broad Sound, and up to Portland, and the ebb tide the reverse. Your soundings, between Seguine and Cape Elizabeth, are various; at times you have 18 or 20 fathoms, rocky bottom, and within a cable's length you will find 30 or 35 fathoms, muddy bottom.

HENDRICK'S HEAD LIGHT is a fixed light, 30 feet above the level of the sea, on the starboard hand going in, near the mouth of Sheepscut River.

SHEEPSCUT RIVER.—If you are bound to Sheepscut River from the westward, and make Seguine light, you may leave it on your starboard hand, giving it a berth of half a mile; when you pass it to the eastward you must bring it to bear S. W. by S., and steer N. E. by N., which course will carry you to Ebenicook Harbor, distant three leagues, leaving three dry ledges on your starboard hand, and one on your larboard. This harbor is very narrow at the entrance, but makes a large basin when you get into it; in the entrance it lies E. N. E. You cannot get in here with a N. E. or easterly wind, but must have the wind south or westerly; after you get into this harbor, you must haul up N. E., or N. E. by N., for there are several sunken rocks on the starboard hand as you go in, which you are to avoid. The best anchorage is against Capt. Smith's wharf, where you are 4 fathoms, muddy bottom; and you will lie safe from all winds. But if you are bound up Sheepscut River, in a large vessel, and come from the westward, pass Seguine light to the southward, steer N. E. until you bring Hendrick's Head to bear N. a little westerly, then run for it, keeping the starboard shore close aboard. There are many rocks and ledges, some of them above and some under water, which are all to the eastward of Seguine. When you get up as high as Ebenicook, you leave the two Mark Islands on your larboard hand, keeping your course north a little easterly, but if you only come here to make a harbor, when you get up to Capt. Hodgson's, you will see a bare ledge on your larboard hand, if it is low water, which is covered at high water; you may anchor at 8 fathoms to the northward of it.

LITTLE MARK ISLAND.—On Little Mark Island a stone column is erected, as a land mark for vessels running into or passing either Harpswell or Broad Sound. It is also a conspicuous mark for the mariner, standing in from sea, in any direction between Cape Elizabeth and Cape Small Point. This island, at the entrance of Harpswell Sound, (half way between Portland and the entrance of the River Kennebeck,) is one-fourth of a mile in length, without trees, its elevation 40 feet above the level of the sea; the co-

lumn is placed near the centre of the island, 50 feet high, painted perpendicularly in black and white stripes, except near the top, which is black on each side. Course up Harpswell Sound N. E. ½ N.

Bearing by compass, and distance in statute miles from the column.

To the column on Cape Elizabeth,	S. W. ½ W.	13	miles.
" the outer Green Island,	S. W. by W.	6	do.
" Half-way Rock,	S. by W. ¼ W.	4	do.
" Drunkard's Ledge,	S. ¼ W. to S. ½ W.	1½	do.
" Mark Island Ledge,	S. E. ¼ S.	¾	do.
" South Pilot of Jaquish,	E. ½ S.	1½	do.
" Turnip Island,	E. ½ N.	1¼	do.
" Cape Small Point,	E. by S.	10	do.
" Whale Rock, (out of water,)	S. W. by W.	½	do.
" Haddock Rock or Island, (N. point,)	N. W. ½ W.	½	do.
" S. W. point of Haskill's Island,	N. N. W.	⅛	do.
" Middle of Eagle Island,	W. N. W. ½ W.	1¼	do.
" Mackerel Cove,	E. N. E.	2	do.

If you want to go up to Wiscasset Point, you must keep your starboard hand best aboard, north-easterly, till you come to Cross River, which you leave on your starboard hand. You will not attempt to go up to Wiscasset Point with a head wind and the tide of ebb, for it is 1¾ league from Cross River; but when you have a fair wind and tide, you may proceed without fear. This river is narrow, and lies more to the westward; when you are about a mile or a mile and a half up, you must keep your larboard hand best on board, for there is a ledge of rocks which reaches near half way across the river, which is on your starboard hand, and the rock near the middle is covered at high water, but may be seen two hours before. The river runs straight to Decker's Narrows, then turns round to the westward: when you enter these narrows, you may see the town. In case you should go up in the night, you must be careful of two large rocks that lie W. S. W. of these narrows; the tide of flood sets very strong for them, and they are covered at half tide; you may go on either side of them, and may anchor in 10 or 12 fathoms water, muddy bottom.

It is high water here, at full and change of the moon, about 10 h. 45 m.

NEW MEADOWS.—This river bears N. E., 8 leagues distant, from the pyramid on Cape Elizabeth, and about one league W. from Cape Small Point. If you should fall into this bay with the wind at S. E., or S. S. E., and bound to the eastward, you may make a good harbor in the above river. In standing to the northward, you will have a large round island on your starboard hand, covered with spruce trees, together with two large rocks, one called the Brown Cow, and the other the White Bull, which are some distance from each other. You must leave the Brown Cow on your starboard, and the White Bull on your larboard hand, the latter of which you may go within a cable's length of, and when you have passed it, must stand over for Horse Island, that lies on the starboard, which has a house on it, that you may go within a quarter of a mile of. To the westward of the island lies a large rock, which is covered at high water, but bare at half tide; you may go on either side of it when it is in sight, but the widest passage is to the eastward. When you have passed this rock, steer N. by W., or N. N. W., which course will carry you up with a large island, called Bear Island, which is covered with spruce and birch trees. When you have passed this island about one-quarter of a mile, you may haul in for the starboard shore, and anchor in 5 or 6 fathoms water. This is the best place to anchor, with the wind at S. S. E., or E., but be careful of a ledge of rocks that runs to the northward of this island, about half a mile off. You may anchor in this bay according as the wind may be; if it should be at the eastward, anchor on the east side. If you have lost your cables and anchors, there is a large cove on the starboard hand, about two miles from Bear Island, bearing about N., which is sufficient to hold 30 or 40 sail of vessels. It is land-locked all round, so that no wind can damage a vessel after she gets into it.

HUSSEY'S SOUND.—If you come from the eastward, and make Seguine light, bring it to bear E., and steer W. for Hussey's Sound, if you have a fair wind and daylight, as you have nothing but islands on your starboard hand. The tide of flood sets very strong in between these islands: when you get within two miles of Hussey's Sound, you will make two islands which have no trees on them, called Green Islands. You continue your course till you make Hussey's Sound, bearing N. N. E., then you may steer in with your course N. N. E.

When you pass the two islands, after entering Hussey's Sound, you leave three islands on your larboard, and two islands on your starboard hand; the northern island, on your starboard, is called Smith's Island; when you pass said island, about three-quarters

of a mile, you may haul away E. N. E. till you shut in said island to the S. E., then you may anchor in 8 or 9 fathoms, muddy bottom: Hog Island to the S. W., Basket Island to the N. W., Great Gabegue Island to the N. E., and Smith's Island to the S. E. Here you may moor 200 sail of ships, safe from all winds, and when wind and tide serve, you may be out to sea in one hour.

HALF WAY ROCK is high and black, about 600 feet in diameter, elevated 16 feet above the level of the sea, at high water. At the distance of 600 feet from the rock, on the N. W., North, N. E., E., and S. E. sides, there are from 5 to 6, and gradually deepens to 25 fathoms, within three-quarters of a mile of it. A reef extends off W. by S., distant about an eighth of a mile. Within one cable's length of said reef you will find from 10 to 12 fathoms water. You may near this rock on all sides within a quarter of a mile, and find from 15 to 25 fathoms water. Seguine light-house bears from the rock E. ½ N., distant about 15 miles; Drunken Ledges, N. N. E., distant about 2½ miles; Mark Island, N. by E. ½ E., distant about 4½ miles; the light-house on Cape Elizabeth, S. W. by W. ¾ W., distant about 9 miles; Cod Rock, (shoalest part,) S. W. by S., distant about 6 miles; Portland light-house, W. ½ S., distant about 11½ miles; Green Islands, W. ½ N., distant about 5 miles; Jewill's Island, N. W. by N., distant about 3 miles; Eagle Island, N., about 4¼ miles. Drunken Ledges may be seen at all times, breaking with a little motion of the sea. Mark Island is a small bare Island, and has a stone monument erected on it as a guide for vessels running into Broad Sound. Eagle Island is a small high island, covered with trees, at the entrance of said sound. Mark Island and Eagle Island form the eastern side of the entrance to Broad Sound. Brown Cow and Jewill's Islands form the western side. Green Islands are two in number, and bear from Jewill's Island S. W., distant about one and a half mile.

Cod Ledge is about half a mile in circumference, and has on the shoalest part of it two and a half fathoms, at low water, and gradually deepens to 3, 5, 7, 8, and 12 fathoms, and bears from Portland light-house, E. S. E., distant about 7 miles, and from Cape Elizabeth light-house E. by N. ½ N., distant about 5 miles; Green Island S. S. E., distant about 3 miles. This ledge often breaks in a heavy south-east gale.

PORTLAND HARBOR.—Cape Elizabeth lights are situated on Cape Elizabeth, south of the entrance to Portland Harbor, about 140 feet above the level of the sea, and 300 yards apart, bearing from each other S. W. ½ W., and N. E. ½ E. The western light revolves once in two minutes, the eastern is a fixed light.

E. S. E. from these lights, 2¾ miles distant, is a dangerous ledge, called Alden's Rock, with four feet water on it at low tide. Also a reef, called Taylor's Reef, bearing S. E. by S., 1⅛ mile distant, having 2½ fathoms at low water. E. by N. ¼ N. from the lights, 5¾ miles distant, lies Bulwark Ledge, having 2½ fathoms on it at low water.

The following are the bearings and distances, from the north-easterly light, of the shoals and reefs, and of other light-houses in sight of, and near the cape, viz.:

Alden's Rock,	S. E. by E.	2⅔	miles.
Hue and Cry	S. E. ⅕ S.	3¾	do.
Taylor's Reef,	S. S. E. ½ E.	1¼	do.
Broad Cove Rock	N. N. E. ½ E.	1¼	do.
Outer point of Watch Ledge,	S. W. ¼ S.	2	do.
S. E. side of Richmond Island,	S. W.	2½	do.
Seguine light,	E. by N. ¼ N.	24	do.
Wood Island light,	S. W. ½ W.	10½	do.
Portland Head light,	N. ¼ E.	4	do.

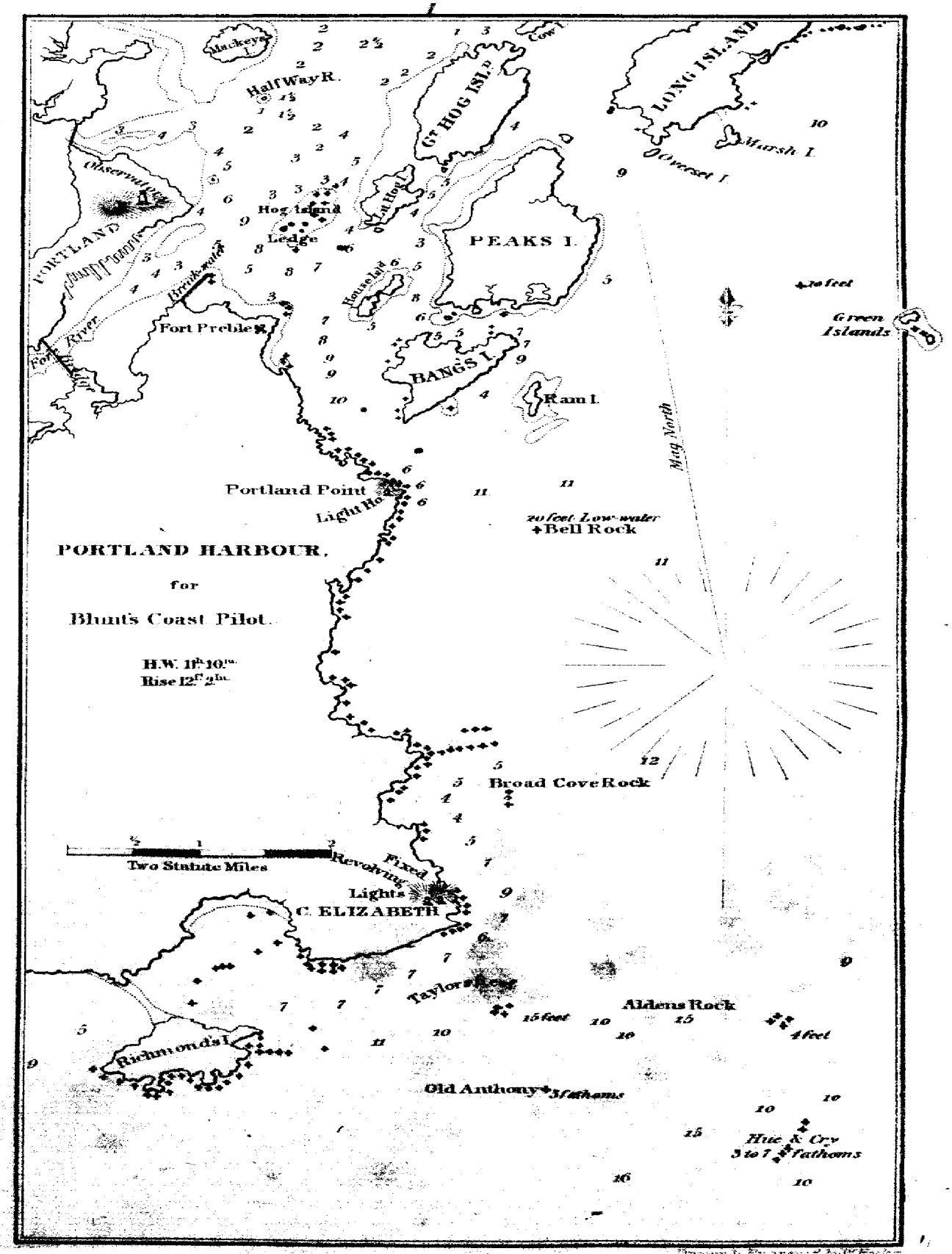
Portland light-house is on a point of land called Portland Head, at the western entrance of the harbor. It is a stone edifice, 72 feet high, exclusive of the lantern, which is 13 feet, and contains a fixed light.

A red spar buoy is placed on Alden's Rock, with a staff of about 12 feet long, to which is attached a red flag. There are also two watch buoys within 15 or 20 feet of this buoy, on the following bearings:

Hussey's Sound, viz., from the buoy N., about 8½ miles distant.
Northern light-house on Cape Elizabeth, N. W. by W. ¼ W.
Southern light-house on the same, N. W. by W. ½ W., distant 3 miles.
The barn on Richmond's Island, W., distant 4½ miles.
Portland light-house, N. N. W. ¼ W., distant 6¼ miles.
Wood Island light-house, S. W. by W. ¼ W., distant 13 miles.

The most dangerous part of this ledge are two rocks bearing from each other E. S. E. and W. N. W. The distance between these rocks is 420 feet.

The western rock is about 12 feet in diameter, and has 5½ feet on it at low water. The eastern rock is about 30 feet in diameter, and has but 7½ feet at low water. Between these rocks are 3, 4, and 5 fathoms. The western rock bears from the buoy S. by W., distant 240 feet. The eastern rock bears S. E. ½ S., distant 520 feet. At the distance of



E. & G. W. Blunt, 179 Water Street, New York.

Drawn & Engraved by W. Rocker

600 feet from the eastern rock, on the S. E., E., and N. E. sides, are 4, 5, and 6 fathoms water. At the distance of 300 feet from the western rock, on the S. W., W., and N. W. sides, are 6, 7, and 8 fathoms.

Vessels bound to Portland, falling in to the westward, and making Wood Island light, must bring it to bear S. W. by W. ¼ W., and steer N. E. by E. ¼ E., 13 miles, which will bring them up with the buoy on Alden's Ledge.

Should they fall in to the eastward, and make Seguine light, they must bring it to bear E. by N. ¼ N., and run W. by S. ¼ S., 9 leagues, which will bring them up with the buoy.

In passing the buoy to the E., give it a berth of one-quarter of a mile. If to the west, you may near it within a cable's length.

If running for Portland Harbor, bring the buoy to bear S. S. E., and steer N. N. W. 6¼ miles, which will bring you up with Portland light. Continue this course until you are half a mile within the light-house, then bring it to bear S., and steer N. by W. for House Island, which is two miles N. by W. from Portland light. Should you wish to go further up the harbor, follow the directions given here.

The course from the buoy to Hussey's Sound is North.

N. B. Vessels of a large draught will find the best water by bringing Portland light to bear N. W. by N., and running directly for it.

Coming from the south-westward, when within half a mile of Cape Elizabeth, the red buoy on Broad Cove Rock may be seen; it bears N. N. E. from the pitch of the cape, distant one and a half mile, and lies in twenty-four feet water. When up with this buoy, leave it on the larboard hand, half a cable's length distant, and steer N. by E. ½ E. 1 mile, which will carry you up with the white buoy on Trundy's Reef, which lies in 16 feet water. Giving it the same berth as the other, you may then run N. by W. ½ W. for Portland light-house, 3 miles distant. When up with the head on which the light-house stands, give it a small berth, and steer N. by W., leaving Bang's Island on the starboard hand, till you come to House Island, the S. W. point of which bears N. from the light-house, distant almost 2 miles. Before you are up with this island, the black buoy on Spring Point Ledge may be seen; it bears N. W. by W. from the S. W. part of House Island, distant half a mile, and lies in 14 feet water. When up with this buoy, you open the town. Giving the black buoy a small berth, you may haul up N. W. for the white buoy on Stanford's Ledge: this buoy lies also in 14 feet water, and one mile distant from Spring Point Ledge buoy. Giving the white buoy a small berth, you may keep up midway the river, and anchor opposite the town, where you please, in safety.

Vessels coming from sea, and bound into Portland, may, by giving the lights on Cape Elizabeth a berth of 4 miles, run to the northward and eastward until Portland light bears N. W., and then stand directly for it, which will clear all the ledges.

There are also two small buoys, on two ledges in White Head Passage, at the N. E. part of Bang's Island. This passage is narrow, and but seldom used with large vessels. By keeping midway between the two buoys, the red on the starboard, and the white on the larboard hand, in coming in, you will have not less than 5 fathoms water. After passing the buoys, keep midway the passage, and run one mile distance, which will carry you into ship channel, the same as if you had passed the light-house.

[N. B. All the above mentioned buoys are to be left on the larboard hand, in coming in, and the depth of water put down is at low water.]

NOTE.—*If by accident either of the buoys should be removed, the following directions for sailing into Portland Harbor will be found useful.*

When you come from the south-westward, and intend to go into Portland, give Cape Elizabeth a berth of half a mile, and steer N. N. E. until you bring Portland light-house to bear N. N. W., when you must haul up N. N. W., if the wind will permit; but if you are in a large ship, and the wind N. W., or W. N. W., your safest way is to continue your course N. N. E., which will carry you safe into Hussey's Sound, allowing it to be tide of flood, as Portland Sound is narrow, but bold between the light-house and Bang's Island, the latter of which is on your starboard hand. If you should turn into Portland in the night, in standing to the south-westward, you must go about as soon as the light bears N. N. W., and in standing to the eastward, you must go about as soon as the light bears W. N. W., for there is a ledge of rocks that bears S. by E. from Portland light-house, and also a low island, called Ram Island, east northerly, one mile distant from the light-house: but if you have a leading wind you may go in without fear, keeping about middle of the channel way, and when abreast of the light, steer about N. by W. for House Island, which you leave on your starboard hand; when you pass House Island, bring it to bear S. E. by E., and steer N. W. by W., or W. N. W., with the tide of flood. In steering the above course, you will see a round bushy tree to the north of the town, and a house with a red roof, and one chimney; bring the tree to the west of the house, which course will carry you up the channel way, in 6 or 7 fathoms water; but when you come abreast of the fort which stands on a hill, haul away W. S. W., as there is a shoal bank on your starboard hand that has not more than 10 or 12 feet on it at high water, which you are to

avoid. Here you will be careful of two ledges of rocks, one called Spring Point Ledge, two miles N. by W. ½ W. from the light-house, and the other three miles, bearing N. by W. ½ W., called Stanford's Ledge, which has a buoy on it, and stretches off from your larboard hand near half a mile in length. They lie to the S. W. of House Island, and are all bare at low water. If you are obliged to turn in here, they are much in the way, and when you are standing to the southward, be careful of them. The marks will do in the day-time, but are of no service in the night. There is a pilot who generally attends here. This harbor is open to the wind at N. E. and E. N. E. If you should come in a dark night, your best way is to go into Hog Island Road, which may be done by steering as follows:—when you pass the light-house, steer N. by W. until you pass Bang's Island, which you will leave on your starboard hand; in steering this course, you will make House Island, which you will leave on your larboard hand; when you are between both of these islands, you steer N. E. by E. till you come to the second island on your starboard hand. If it is day-time, you will see a large house on said island, and may anchor as soon as abreast of it, in 10 or 12 fathoms, muddy bottom.

If you should fall in to the eastward of Portland, and make Seguine light, bring it to bear E. and steer W., which course you are to continue till you make Portland light to bear from N. W. to W. N. W., when you may run for it without fear.

You must have some regard to the tide of flood, which sets very strong between the islands to the eastward of Portland.

MASTERS who sail from Portland, or ports adjacent, are informed, that from the OBSERVATORY on Fort Hill, by means of the telescope placed there, vessels approaching the coast may be discovered at 15 leagues distance; and their colors or private signals can be distinguished 8 leagues, if the weather should be clear and the colors hoisted, or suspended in such a manner as to present them fair to the Observatory. Should any need assistance, they will set their ensign over their private signals; and may be assured if they can be discerned, that their situation will be made known to their owners.

The Observatory bears N. N. W. ¼ W. from Portland light-house, 4 miles distance; and these, in range, are a good mark to clear Alden's Rock; which, keeping the above in range, you will be nearly three-quarters of a mile to the eastward of.

The Observatory is on an eminence 141 feet above high water mark; and the building 32 feet high, painted red, and the telescope placed near the top.

Vessels falling in with Cape Elizabeth, and wishing to make a harbor in a strong N. W. wind, must observe the following directions:

Give this cape a berth of one-quarter of a mile, and steer N. E. nine miles, leaving the Green Island on the starboard hand, which will carry you up with the S. W. point of Crotch Island. Give this point a berth of half a mile, and steer N. N. E. ½ E., which will carry you between Hope Island on the north and Crotch Island on the south. You may anchor midway between the two islands, in about 13 fathoms water. The shores on each side are very bold.

BOON ISLAND.—This island is very low, about one-quarter of a mile in length. A light-house is built on the west part of the island, a little to the westward of the former light. It is 50 feet above the surface, shows a fixed light, elevated about 70 feet above the level of the sea.

There is a passage between the island and the main, half a mile within the former, between 4 and 5 miles wide, in from 12 to 20 fathoms, nearly up with York Ledge. There is a ledge off the north part of Boon Island, one-fourth of a mile distant, which shows at low water.

The following are the soundings around Boon Island.

Boon Island light-house bearing				W. ½ S.	1	mile distant,	21 fathoms.
"	"	"	"	do.	1½	do.	25 do.
"	"	"	"	do.	1¾	do.	24 do.
"	"	"	"	W. ½ N.	2	do.	12 do.
"	"	"	"	W. ¾ N.	2	do.	8 do.
"	"	"	"	W. by N.	2	do.	18 do.
"	"	"	"	W. by N. ½ N.	1½	do.	23 do.
"	"	"	"	S. E. by S.	½	do.	15 do.
"	"	"	"	S. E. ¼ E.	1	do.	23 do.
"	"	"	"	S. E. by E.	2	do.	12 do.
"	"	"	"	E. ¼ N.	4	do.	18 do.

From Agamenticus Hill, Boon Island bears S. E., distant 5 or 6 leagues, and when you come in from sea, and make Agamenticus Hill, being N. W. by N., you are then to the westward of Boon Island Ledge, but when said hill bears N. W. by W., you are to the eastward of it. From Boon Island to Cape Elizabeth the course is N. E., distant about 40 miles.

I would recommend to all mariners, in coming from the eastward, not to go to the

northward of lat. 43° N. in thick weather, unless they are well acquainted, and judge themselves to be to the westward of Boon Island Ledge, as this has proved fatal to many who were unacquainted.

We have been informed there is a ledge of rocks due north from Boon Island, one mile distant: the gentleman who gave the information, since deceased, and whose veracity and experience could be relied on, said, "I have passed this place several times, but never discovered the ledge till the year 1783, when, being bound to the eastward, the wind took me from the westward, but the vessel having no more than steerage way, I hove over a line to catch fish, and found I had 24 fathoms water, sandy bottom, and in a few minutes I had but 10 feet of water, and my vessel drawing 9. All that saved me from striking was, that the water being entirely smooth, the current set me to the eastward, and I got into 24 fathoms within the length of the vessel, from where I sounded, and had but 10 feet."

YORK LEDGE.—This ledge is four feet above water at low water; the part above water is about 60 yards from N. E. to S. W., and about 50 yards from N. W. to S. E.; the water deepens rapidly but regularly from it.

It bears about three miles S. E. from the south point of York River, and two miles outside of Stone's Rock; between them is a good channel of deep water, but it is not generally used.

The N. E. breaker bears from Boon Island light W. by S., 5 miles distant.

S. W., one mile from York Ledge, there is a sunken ledge, called the triangle; it is never bare, but breaks at low water.

YORK HARBOR.—This is a small harbor, but once entered is safe; twelve feet can be carried in at low water; rise of tide 9 feet.

WHITE HILLS.—These hills lie N. W. from Portland, and N. N. W. from Wood Island light-house. You may see them in clear weather when no other part of the land is in sight. At the first sight they appear like a cloud, and are always white, occasioned, it is said, by their being covered with white moss. They have been seen when in lat. 43° 10′ N., 23 miles S. from the light-house on Cape Elizabeth. The depth of water in the above latitude is 80 fathoms, muddy bottom. When you steer N. W. or W. N. W. from this latitude, you will make Agamenticus Hills, and when bearing W. by N., 6 or 7 leagues, they appear like three hills, the smallest of them to the eastward. At the same time you will make Well's Hills, bearing W. N. W., and when you are on the northern part of Jeffrey's Ledge, in 45 fathoms water, you will see the hills of Agamenticus bearing W. by N., or W. N. W.

Between Jeffrey's and the Isles of Shoals you will have 70 and 75 fathoms water, muddy bottom, and a strong current setting to the S. W. You may see the Isles of Shoals 5 or 6 leagues, when you are to the eastward of them, but will first see the light-house, which is on White Island, and the meeting-house on Star Island, bearing N. E. and S. W. from each other, distant seven-eighths of a mile.

CAPE PORPOISE TO WOOD ISLAND LIGHT.—Wood Island light is situated near the entrance of Saco River, on the east side of the island. The lantern is elevated 45 feet above the level of the sea, and contains a revolving light. Wood Island is high woody land, and very even, and lies N. E., 3 leagues distant from Cape Porpoise. In running for the light, bring it to bear N. N. W., or N. W., and run till within a cable's length with safety. You may go into this harbor either at the eastward or westward of the island. There are several rocks to the westward of the island, and also a long bar which lies to the S. W., about three-quarters of a mile distant, together with two ledges, one of which bears S. E. by S. from the light, distant half a mile, having 10 feet water on it at low tide, and the other is a dangerous ledge called Danceberry, bearing S. by E. from the light, distant about three-fourths of a mile, and breaks at all times. When you have the wind to the southward, you may lay your course in, and anchor near Stage Island, on which is a monument: this is called Winter Harbor. You may go in the eastern way, and have room to turn your vessel, which is an advantage you cannot have in going in to the westward; but here you are exposed to the wind at N. E. and E. N. E., but if your cables and anchors are not good, you may run into the Pool, and lie safe from all winds.

In running in the eastern passage, you open a small channel for boats only, between Wood and Negro Islands, but no man of experience would mistake it. Negro Island is small, with two stores on it, and is left on the larboard hand.

Saco lies about a league to the north-west, but is a barred place, and has not above 10 feet at high water, which makes it not fit for a stranger to go in; there is, however, considerable navigation owned here, and the inhabitants are enterprising.

RICHMOND'S ISLAND.—The next place to Wood Island is Richmond's Island, which lies about N. E. northerly, 4 leagues. This place is only fit for small vessels, such as coasters, and but few vessels put in here, it being only one league to the westward of Portland, which is the principal port in the State.

In sailing by Richmond's Island, you must be careful of a sunken ledge, called Watch

Ledge, that lies off about S. E., near half a mile from the N. E. end of the island: it does not show itself except the wind blows fresh, but you need not go so near the island, unless you have a scant wind, or turning to windward.

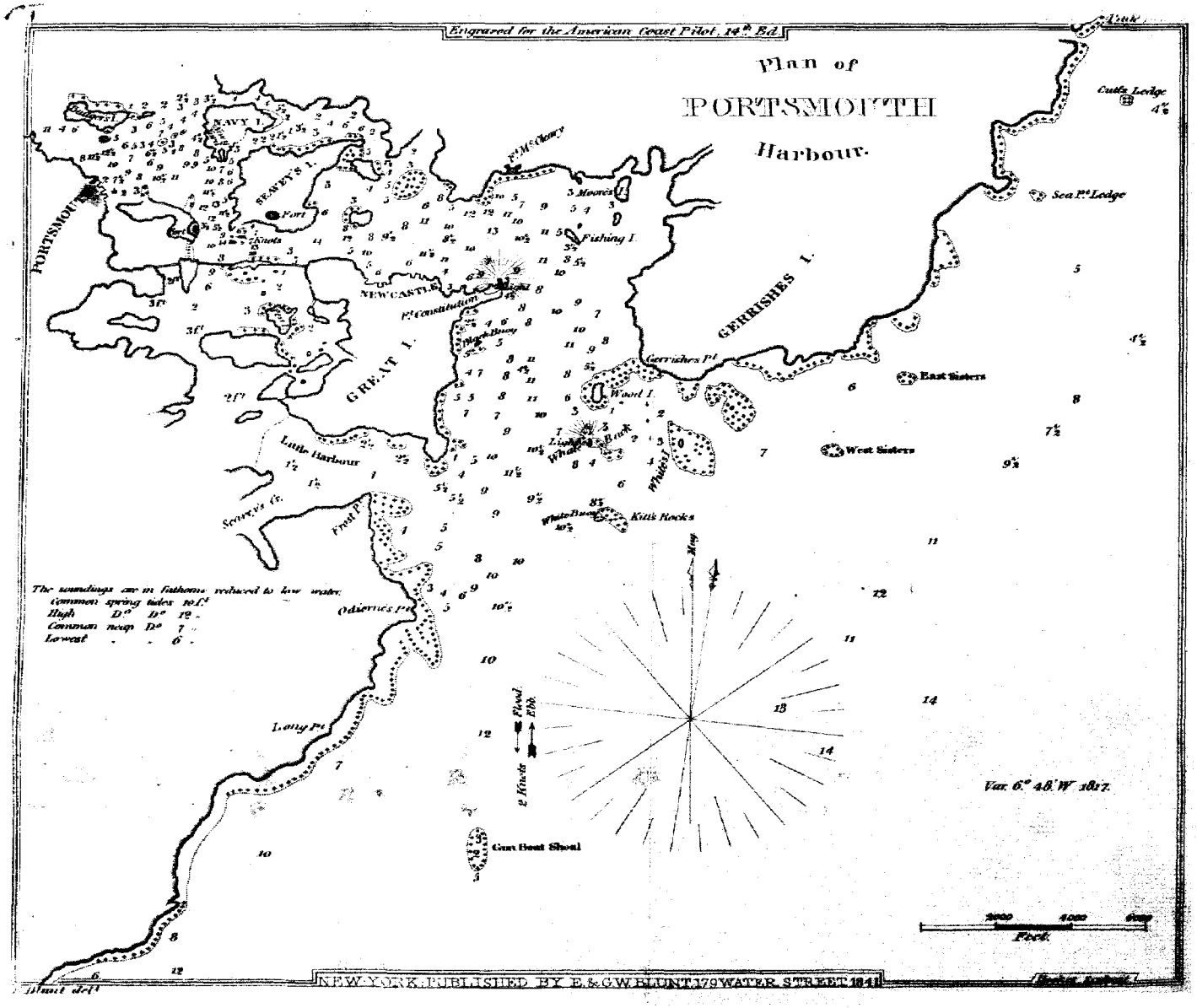
CAPE NEDDOCK TO CAPE PORPOISE.—Your course from Cape Neddock to Cape Porpoise is N. E., distant 4⅔ leagues. Cape Porpoise is a bad harbor, and not to be attempted, unless you are well acquainted or in distress. In going in you must leave two small islands on your larboard hand, and three on your starboard. It may be known by the high land of Kennebunk, which lies to the N. W. of it. When the harbor bears N. W. you must haul in, but be careful of the point on your larboard hand, and not go too near it, as it is very rocky. As soon as you are in the harbor, and clear of the point of rocks on your starboard hand, your course must be N. W. about two cables' length, when you must come to, and moor N. E. and S. W., or run direct for the wharf. A vessel that draws 10 feet will be aground at low water. The harbor is so narrow that a vessel cannot turn round; is within 100 yards of the sea, and secure from all winds, whether you have anchors or not.

CAPE PORPOISE HARBOR.—The light-house stands on the south-west part of Goat Island, and contains a fixed light, elevated thirty-three feet above the level of the sea. The following are the directions for the harbor:—If you are to the eastward, and make Wood Island light, and bound to Cape Porpoise Harbor, bring Wood Island light to bear N E. by N., and run S. W. until you bring Cape Porpoise light to bear N. by W.; then steer direct for the light until you shut Wood Island in by the eastern head of Cape Porpoise Harbor: then you are abreast of a breaking ledge called the Old Prince, which bears from Cape Porpoise light-house S. E. by S., half a mile distant; then steer N. N. W. until Cape Porpoise light bears E. N. E.: you are then up with the entrance of the harbor. Then, if low water, keep midway between the two points; but if high water, keep the larboard shore best aboard. When up with the points, steer N. W. a quarter of a mile, and anchor in three fathoms water, at low water. By following these directions you will find from 3 to 6 fathoms water. In coming from sea, and making Cape Porpoise, and intending to go into the harbor, bring the light to bear N. by W. and follow the above directions. This harbor is not so safe for large vessels, and must not be attempted, unless with a fair wind. Wood Island lies about 10 miles to the N. E. of Cape Porpoise, and has on it a repeating light. Folly Island lies opposite the light-house, and forms the western side of Cape Porpoise Harbor. The S. S. E. part of Folly Island Point bears from the light S. ½ W., distant about 1¼ mile. The shoal runs off nearly three-quarters of a mile.

NOTE.—A spar buoy, painted red, elevated 9 feet above the surface of the water, has been moored near the Old Prince, in 8 fathoms water, at low water, and bears from Cape Porpoise light-house S. S. E., distant about five eighths of a mile; Old Prince bears from the buoy N. N. E., distant about one-eight of a mile; Folly Island Point, west, distant about one-quarter of a mile. In running for Cape Porpoise Harbor, you may go on either side of the buoy, by keeping it close on board, and after passing it bring it to bear S. E. by S., and steer N. W. by N. for the entrance of the harbor and follow the above directions.

KENNEBUNK.— A buoy has been moored near the Fishing Rocks, at the mouth of this harbor. The Fishing Rocks extend E. N. E. and W. S. W., nearly half a mile distant. The shoalest parts of the rocks are bare at 2 hours' ebb, and may be seen breaking, at all times, with a little motion of sea. On this shoal there is a spindle erected, with a small cask upon its end; the buoy bears from the spindle, N. E. by E. ½ E., distant about a quarter of a mile; from the spindle to the piers at the entrance of the harbor, N. E. by N. ½ N., distant about 1 mile; Flying Point, E. by N., distant about three-quarters of a mile; Fox Point, N. E., distant about three-quarters of a mile; Boothby Point, N. by W., distant about three-quarters of a mile; Harding's Rock, W. N. W., distant about three-eighths of a mile. This is a barred harbor, and cannot be entered except at high water. If bound to Kennebunk, you must leave the spindle and buoy on Fishing Rocks on the larboard hand, about a cable's length distant, and Flying Point and Fox Point on the starboard hand, and after passing them steer north or N. by W. a quarter of a mile, and anchor in from 3 to 4 fathoms water, sticky bottom, where you may lie safe, with the wind from N. E., N., or N. W. Flying Point and Fox Point are bold, and you may near them to within an eighth of a mile. The above mentioned buoy is a spar, painted red, elevated 10 feet above the surface of the water, and is moored in 4 fathoms at low water. Kennebunk is not frequented as a harbor, but vessels may, in stress of weather, run in and lie safe, with the winds above mentioned.

At the mouth of Kennebunk Harbor are two piers, one on the eastern and one on the western side of the channel, running from the shore about 3 or 400 feet towards the bar, extending a little beyond low water mark, with a flag staff and beacon on the top, which may be seen about one mile distant. A ledge of rocks lies off the harbor, called the Fishing Rocks, distant about three-quarters of a mile from the head of the piers, between which is the anchoring ground. The ledge bears due south from the head of the piers.


Engraved for the American Coast Pilot, 14th Ed.
Plan of
PORTSMOUTH
Harbour.
PORTSMOUTH
NAVY I.
SEAVEY'S I.
Fort
Knots
Pt McClary
Moores
Fishing I.
NEW CASTLE
Pt Constitution
GREAT I.
GERRISHES I.
Gerrishes Pt
Wood I.
Little Harbour
Seavey's Cr.
Frost Pt
White Rock
Kittle Rocks
Odiernes Pt
Long Pt
Gun Boat Shoal
Cutts Ledge
Sea Pt Ledge
East Sisters
West Sisters
The soundings are in fathoms reduced to low water.
Common spring tides 10 f.t
High D.o D.o 12 .
Common neap D.o 7 .
Lowest . . 6 .
Flood
Ebb
2 Knots
Var. 6.° 48.' W 1817.
Feet
NEW YORK. PUBLISHED BY E. & G.W. BLUNT 379 WATER STREET 1841

and is all covered at high water. Vessels approaching the harbor should keep well to the eastward of the ledge; though there is a tolerable passage to the westward, but it ought not be attempted by a large vessel without a good pilot.

Depth of water on Kennebunk Bar, at low water, from 2 to 3 feet; rise and fall of common tides from 8 to 9 feet, increasing sometimes to 10 and 12 on full and change. Time of high water, full and change, 11h. 15m.

PORTSMOUTH LIGHT-HOUSE is near the mouth of the harbor, on the west side, on the N. E. point of Great Island, near Fort Constitution. It is 90 feet above the level of the sea, and shows a fixed light.

The following are the bearings and distances of places to be observed and avoided approaching the harbor, viz.

Kitt's Rock Buoy bears S. 27° E., 2 miles distant, } From Portsmouth light-house.
Odiorne's Point, S. 9° W., 2 miles distant, }

GUN BOAT SHOAL.—Four miles from Portsmouth light-house, bearing S. 4° W., lies Gun Boat Shoal, having not less than 3½ fathoms on it, and that only on its shoalest part, which is small; it runs E. N. E. and W. S. W. about two cables' length, and bears from Whale's Back light S. by W. ½ W. From Odiorne's Point S. ½ E.

WHALE'S BACK LIGHT-HOUSE is situated on the east side of Portsmouth Harbor. Its height is 68 feet from low water mark. It has two fixed lights, one ten feet below the other.

The following are the bearings and distances of places from Whale's Back light-house:

Western Sister	E.	2	miles distant.
Eastern part of Duck Island	S. 44 E.	7	do.
Boon Island light	N. 78 E.	14	do.
Odiorne's Point	S. 40 W.	1½	do.
Kitt's Rock Buoy	S. 23 E.	½	do.

PORTSMOUTH HARBOR.—If you fall in to the eastward, make Cape Neddock, and are bound to Portsmouth, when within half a mile of said cape, your course is S. S. W., 4 leagues, which course you will continue till you bring Portsmouth light-house to bear N. by W., and the lights on Whale's Back to bear N. N. E., then steer N. by E., or N. N. E., (leaving Whale's Back light on the starboard hand,) having four fathoms water, until you are abreast of Portsmouth light, which you may round within one quarter of a mile, when you must steer N. W. until it bears S. S. E., and anchor in 9 fathoms, good bottom.

A black spar buoy has been placed on Cod Rock near Fort Point, at the entrance of Portsmouth Harbor, in thirteen feet of water. Vessels passing into the harbor, by leaving this buoy on the larboard hand, thirty feet distant, will have six fathoms of water.

A black spar buoy has also been placed at the ledge at the N. E. point of Amazeen's Island, in ten feet of water. Vessels passing up the harbor, by leaving this buoy on the larboard hand, thirty feet distant, will have nine fathoms of water.

A black spar buoy has also been placed on the eastern edge of Sunken Rocks, in ten feet of water, bearing about east, from the monument on said rocks. Vessels passing up the harbor, by leaving this buoy on the larboard hand, forty feet distant, will have seven fathoms of water.

Two spar buoys have also been placed as guides, in entering Spruce Creek Harbor, to wit: a white buoy on the S.W. point of Hicks' Rocks, in fourteen feet of water, and a black buoy on Jamaica Point, in ten feet of water. Vessels entering Spruce Creek Harbor, by leaving the white buoy on the starboard hand, thirty feet distant, will have five fathoms of water; and by leaving the black buoy on the larboard hand, fifty feet distant, will have six fathoms of water.

After passing the two last mentioned buoys, about one hundred feet, vessels may anchor in seven fathoms of water, in good muddy bottom, and by keeping in mid-channel, and running about N., may anchor in the creek, in six or seven fathoms.

N. B. Hicks' Rocks are under water at about two-thirds tide; and the depths of water named in the preceding directions were taken at low water.

If coming from the eastward of the Isles of Shoals in the night, bring Portsmouth light to bear N.W. by W.½ W., which course will carry you clear of Duck Island; continue this course until White Island light bears S. S. W., when haul up W. by N., and continue that course until the light bears N. by W., when you may run for it with safety.

You may also, if coming from sea, and make the Isles of Shoals, and are to the eastward of them, run for them till within one mile of the eastern isle, then steer W. N. W. until Portsmouth light bears N. by W., then follow your directions as above, passing Whale's Back light on the starboard hand.

Beating into Portsmouth Harbor, it is not prudent to stand to the eastward farther than to bring the light to bear N. N.W., or to the westward farther than to bring it to bear N. by W.

If you come to the westward of the Isles of Shoals, give White Island light a berth of one mile and a half, bring it to bear east, and then run N. by W. for Portsmouth light, 9 miles distant.

On the east side of the entrance of the harbor, lies Kitt's Rock, on which is a White Buoy, and S. by W. one quarter of a mile from the light-house lies Stillman's Rock, over which is a Black Buoy; both rocks are under water. Give the buoys a good berth, and there is no danger.

When you come from the S. W., and make Cape Ann, and to the eastward of the Dry Salvages, bring them to bear S. by E. and steer N. by W. or N. ½ W. In entering this course you will make the Isles of Shoals, from which you may take a new departure, by bringing the light-house to bear east, distant 1½ mile, and run N. by W. for Portsmouth light.

If you are bound to the eastward from Portsmouth Harbor, you steer S. by E. one league from the light-house, then steer N. N. E. for Old York or Cape Neddock, which is 4 leagues from Portsmouth, but if the wind should come from the northward, you must be careful of York Ledge.

ISLES OF SHOALS.—By the benevolence of the Massachusetts Missionary Society, aided by subscriptions of several gentlemen in Newburyport and the neighboring towns, a meeting-house has been erected on Star Island (one of the above islands.)

White Island light-house is built on the westernmost island of the Isles of Shoals; it is 87 feet above the level of the sea, and it revolves in 3 minutes 15 seconds, showing in that time a red and white light.

The following is the description and relative situation of the islands: White island (the south-westernmost island) is a rocky island, three-quarters of a mile in length, from S. E. to N. W., and about one mile and three-quarters distant from the meeting-house. There is a reef that extends about one-third of a mile from the N. W. end, which, in passing, you must give a good berth. The S. E. end bears from the meeting-house S. W. ¼ S., the N. W. end S. W. by W. ¾ W.

In running in for this light there is nothing in the way when coming from the southward or eastward, except Cedar Island Ledge, Anderson's Rock and White Island Ledge.

Bearings from White Island light-house.—Portsmouth light-house bears N. N. W., distant nine miles. Square Rock lies directly in the range, distant from White Island five-eighths of a mile. Boon Island light, N. E. by N., distant 14 miles. Cape Ann lights, S. ¾ W., distant 21 miles. Rye meeting-house, N. W. by W. ½ W., distant 9 miles. Star Island meeting-house, N. E., distant seven-eighths of a mile. North-west point of Hog Island, N. by E. ¾ E. Cedar Island Ledge E. by N. ½ N., distant one mile. Anderson's Ledge S. E. by E. ½ E., distant 1½ mile. White Island Ledge, W. S. W., distant one-third of a mile.

Londoner's (or Lounging)Island lies about 1½ mile to the northward of White Island, is about five-eighths of a mile in length, from S. to N., and is high at each end: in high tides the middle is sometimes covered; a number of rocks lie close about the island, in almost every direction, some of which are always bare. The south end bears W. from the meeting-house; the north end W. N. W. ½ W., about half a mile distant. About half way between this island and Star Island, lies a rock, which is bare at low water; it bears from the meeting-house N. W. by W. ½ W., one-third of a mile distant.

Star Island (on which the meeting-house stands) is about three-fourths of a mile in length from S. E. to N. W., and about half a mile in breadth: it is covered with buildings on the north side. The meeting-house stands on an eminence a little to the northward of the middle of the island; is 12 feet high from the foundation to the roof; to the top of the steeple is 30 feet more; the whole height from the surface of the water is about 65 feet; it is painted white, and the steeple is placed in the middle of the building; it stands fronting the west, and may be seen at a distance of 8 or 9 leagues, in almost any direction at sea; it bears from Thatcher's Island lights (Cape Ann) N. E., 6 leagues distant; from Pigeon Hill, N. by E., 6 leagues distant; from Newburyport light-houses, N. E. ½ E., 6 leagues distant; from Portsmouth light-house, S. S. E. ½ E., 3 leagues distant; from the western Agamenticus mountain, S. ½ E.; from the eastern do., S. ½ E.; from Boon Island light-house, S. W. ½ S., 4½ leagues distant; from Boon Island Ledge, (which lies one league E. from Boon Island,) S. W. by W., 4¾ leagues distant. Off the south end of this island, about three-quarters of a mile from shore, lies Anderson's Rock, which is bare at half tide; in passing give it a good berth; it lies from the meeting-house S. S. E.

Cedar Island is small, and about one-third of a mile in length from east to west, situated between Star and Smutty-nose Islands. The east end of Cedar Island bears from the meeting-house E. ½ N., and the west end E. N. E. ½ E., three-eighths of a mile distant. A rock lies off the S. E. end of this island, half a mile distant, bare at half tide, bearing from the meeting-house E. by S.

Between Cedar and Smutty-nose Islands, the government, a few years since, erected a

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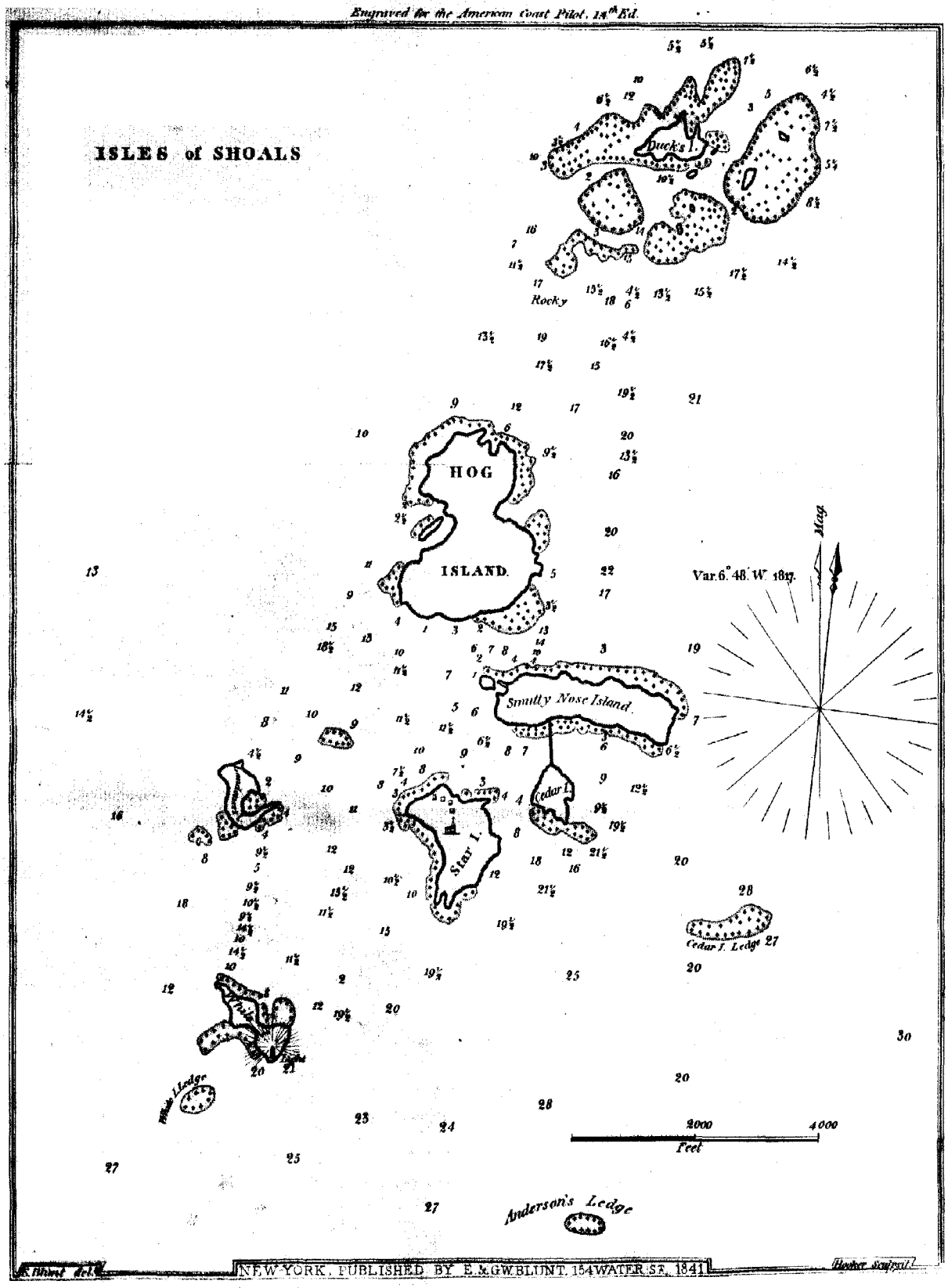

sea wall, to afford a shelter to vessels from easterly gales, and to make the roadstead off the northerly side of Star Island more secure; the violence of the sea in a short time greatly injured the wall, so that the object of its erection has been but partially effected.

Smutty-nose Island is about one mile in length from east to west, and about half a mile in breadth; at the west end is a harbor, called Haley's Cove, where 15 or 20 small vessels may lie safe from all winds. There are several buildings near this harbor. There is a fine channel between this island and Hog Island, which has water sufficient for any vessel, keeping near the middle of the passage. The west end of Smutty-nose Island bears from the meeting-house N. by E. $\frac{1}{4}$ E., and the east end E. N. E., about five-eighths of a mile distant.

Hog Island is a high island lying to the northward of Smutty-nose Island; is about one mile in length from E. to W., and five-eighths of a mile from N. to S. The west end lies from the meeting-house N. by W. $\frac{1}{4}$ W.; east end of do., N. N. E., seven-eighths of a mile distant.

Duck Island (the northernmost island) is a long, low, rocky island; some parts of it are covered at high water, with rocks projecting in every direction, especially at the N. W. end, where a ledge runs off half a mile. It is the most dangerous of any of the Isles of Shoals, and ought carefully to be avoided; it is about seven-eighths of a mile in length from N. W. to S. E. The east end bears from the meeting-house N. N. E. $\frac{3}{4}$ E. The west end N. by W. $\frac{3}{4}$ W., about $3\frac{1}{2}$ miles distant. [☞ See the Plate.]

NEWBURYPORT LIGHTS, on Plumb Island, so called, is situated between the mouth of Merrimack River on the north, and Ipswich Bay on the south, and is separated from the main land by a narrow sound. Its length is about $8\frac{1}{2}$ miles, and its width, from the sea to the main, not more than 500 paces. On the north end of the island are two light-houses, containing fixed lights, which are constantly lighted at night, and so constructed as to be easily moved, a circumstance requisite from the frequent shifting of the bar at the mouth of Newburyport Harbor.

Badger's Rocks bear N. W. $\frac{1}{2}$ N. from the light-house, distant half a mile, and are covered at two-thirds flood, which you leave on your starboard hand. Black Rocks bear N. W. from the light-houses, three-quarters of a mile distant, and are always dry, which you also leave on your starboard hand. Half-tide Rocks (on which is placed a pier) bear W. by S. $\frac{3}{4}$ S. from Black Rocks, distant $1\frac{1}{2}$ mile, and bare at half tide, which you leave on your larboard hand. North Rocks (which also have a pier on them) bear W. by S. from Black Rocks, distant $1\frac{1}{2}$ mile, and are seen only at very low tides, which you leave on your starboard hand, between which and Half-tide Rocks is the channel.

To facilitate the means of conveying immediate assistance to those unfortunate mariners who may be wrecked on this island, a number of gentlemen were incorporated for the purpose, and have completed a bridge and turnpike road from Newburyport to Plumb Island. This road leads in a south-easterly direction from Newburyport, and the bridge across Plumb Island near about one-quarter of a mile to the S. W. of Seal Island. A hotel has been erected at the east end of the bridge, within 100 rods of the sea shore, one mile south from the lights. The hotel is painted white, has three white chimneys, and may serve as a landmark for seamen.

If a vessel, by stress of weather, should be obliged to run ashore on this island, and the master can make any choice of place, it is most eligible to run on as nearly opposite this house as possible, as assistance and shelter can be more promptly afforded, and the communication more direct with Newburyport.

It rarely happens that any life is lost on this beach in attempting to escape from the wreck, when the crew remain on board till low tide. Unless the vessel is in imminent danger of going to pieces immediately, the seamen should never take to their boat.

In a course nearly N. from the light-houses on Plumb Island, and about half a mile distant, across the mouth of Merrimack River, is the southern extremity of Salisbury Beach, called Salisbury Point. From this point a sand beach extends on the verge of the ocean, without an inlet or interruption of any consequence, until it reaches Hampton River. This beach is connected with the main land by a salt marsh of considerable extent, intersected by a variety of small rivulets and creeks, which render it impossible for a shipwrecked mariner to reach the inhabited parts of Salisbury. Here, too, the hapless seaman is sometimes destined to suffer the misfortunes of shipwreck, and to reach a desolate and inhospitable shore, only to aggravate the horrors of his death. If he can attain the first and wished for object, in evading the jaws of the angry ocean, yet he finds himself a solitary wanderer on the coast, without shelter and without sustenance; and in his fruitless search for them, must inevitably perish. As the N. E. storms are generally most fatal to vessels on this part of the coast, Salisbury Beach is not so often a place of shipwreck as Plumb Island.

NEWBURYPORT.—When you come round Cape Ann, and are two miles to the northward of the Dry Salvage Rock, bring said rock to bear S. E., and steer N. W. by W., $3\frac{3}{4}$ leagues, which course and distance will carry you up with Newburyport Bar. In running for the bar from the eastward, strangers should not approach too near Hamp-

ton Harbor, as off the mouth of it lie several sunken rocks. Hampton Harbor lies about 5 miles north from the southern extremity of Salisbury Point, between which and Hampton Harbor, N. by E. ½ E. from the lights on Plumb Island, 3 miles distant, lies another dangerous rock, having only 3½ feet water on it. If you go no further to the westward than for the lights on Plumb Island to bear S. W., there is no danger from either of the above mentioned rocks, but that course to the bar would run you on the north breakers; therefore you must bring the lights to bear W. by S., and anchor in 11 or 12 fathoms water, if the tide will not permit your coming in. No vessel, in coming in, ought to go nearer the south breaker than 7 fathoms water, nor nearer the north breaker, in coming from the eastward, than 9 fathoms. There are several pilots belonging to this harbor, who will, if possible, be outside the bar, to take command of any vessel wanting their assistance. If they cannot, you must keep the lights in range, and run for them till within a cable's length of the eastern light, when you must haul to the westward, and anchor between the two lights in 4 fathoms water. A vessel that draws 10 feet water may come in at two-thirds flood. They should always keep to the windward of the bar, unless the wind should be fair. If the sea is so great as to prevent the pilot's getting over, a signal will be made by him, when you must run direct for his boat, keeping the lights in range, which will carry you safe over. *This bar is constantly shifting, and should not be attempted without a pilot, unless in a case of great necessity.* If your cables and anchors are not good, you may bring the western light-house to bear S. E. by S., and run N. W. by N. for Salisbury Point; but as soon as you make said point, you must haul up N. W., which course will carry you clear of Badger's Rocks, Black Rocks, and the Hump Sands. Across the channel, from the Hump Sands to Black Rock Creek, lie 7 or 8 piers, on which are from 7 to 2½ feet water, at low water, which were sunk in the year 1776, and have not since been removed; the mark to pass between them is to bring the beacon, at the west end of the town of Newburyport, (which may be distinctly seen in clear weather,) over the south corner of the north meeting-house. The Hump Sands lie S. W. from Salisbury Point, which makes the channel very narrow and difficult for strangers. When you pass the Black Rocks, you must haul up W. by S. ½ S., which will bring you in channel way, and good anchorage. And if it be in the night, or dark weather, when you judge yourself about half a mile from Black Rock, you may come to with safety. I would recommend to all masters, whether they belong to Newburyport or not, to avoid attempting that port in a gale of easterly wind, except they are well acquainted, and have a good prospect of getting in, as no pilot can get over the bar when it blows a gale from the eastward. And if you should make Cape Ann lights, and bring them to bear S. by E., or the Dry Salvages to bear S. by E., you may run with safety N. by W., or N. ½ W., distant 10 leagues from Cape Ann, to Portsmouth. In running the above course, you will make the Isles of Shoals, if it is any way clear, from which you take a new departure; when you pass the said islands, you bring Star Island, (on which the meeting-house stands,) to bear S. S. E., and then steer N. N. W., distant from said island 3 leagues, to Portsmouth; or give White Island light a berth of a mile and a half, bringing it to bear east, and then run N. by W. for Portsmouth light. White Island is the south-westernmost island. There is a very good harbor in the Isles of Shoals, from the wind from north-easterly round to southerly, and you may lie land-locked with any of them; but if the wind hauls to the S. W., or W. N. W., you may run in between Smutty-nose Island, which has a wind-mill on it, and Hog Island, where there is water enough for a first rate man-of-war, and where you anchor, have 12 fathoms, muddy bottom.

When you come from the eastward, with the wind at E., or E. S. E., with which wind you cannot weather away Cape Ann, and you are to the northward of the Isles of Shoals, your only shift is to Portsmouth, and you are obliged to run so far to the westward as to bring said port to bear N. N. W., as, generally, the wind at E., at sea, hauls two or three points to the northward, which makes it a head wind. [See the PLATE.]

SIGNALS FOR VESSELS, when in sight, supposed to be bound to Newburyport, and the sea is so large on the bar that pilots cannot get out to their assistance.

When a vessel comes into the bay, and cannot come over the bar at high water, owing to insufficiency of the tide, a Red Square Flag will be hoisted, and a Pendant under it, and as soon as those signals are seen from the vessel in the bay, she must keep off, and try some other port.

When the usual signals for vessels are kept up, the vessel must lay off and on at the bar, keeping to windward, until signals be made for her to come in; and when it is a suitable time to come over the bar, a Red Square Flag will be hoisted at half mast; she may then come in, keeping the lights in range.

When a Pendant is hoisted half mast, the vessel may come in, keeping the lights a little open to the northward.

When a Blue Burgee is hoisted half mast, the vessel may come in, keeping the lights a little open to the southward.

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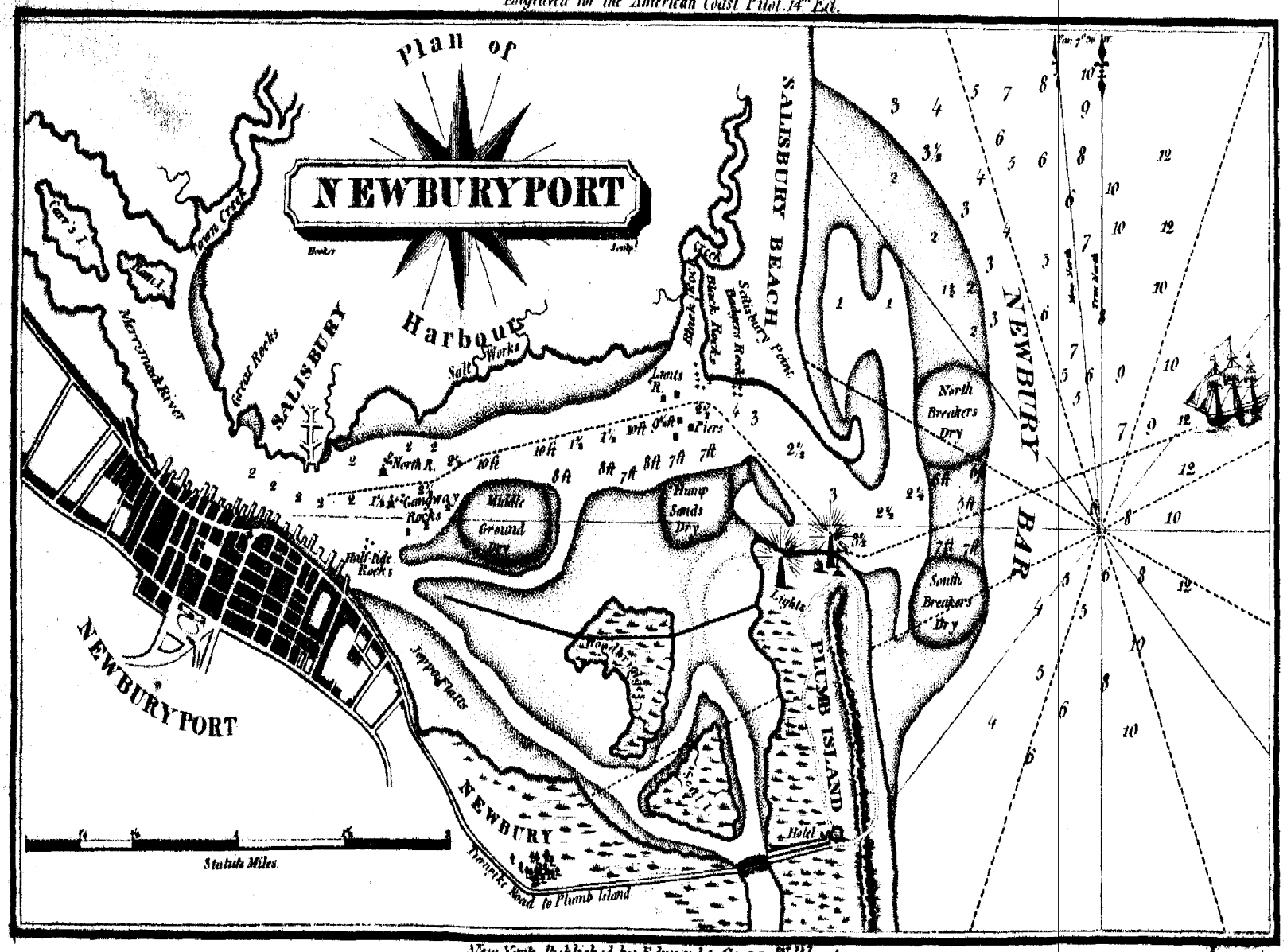

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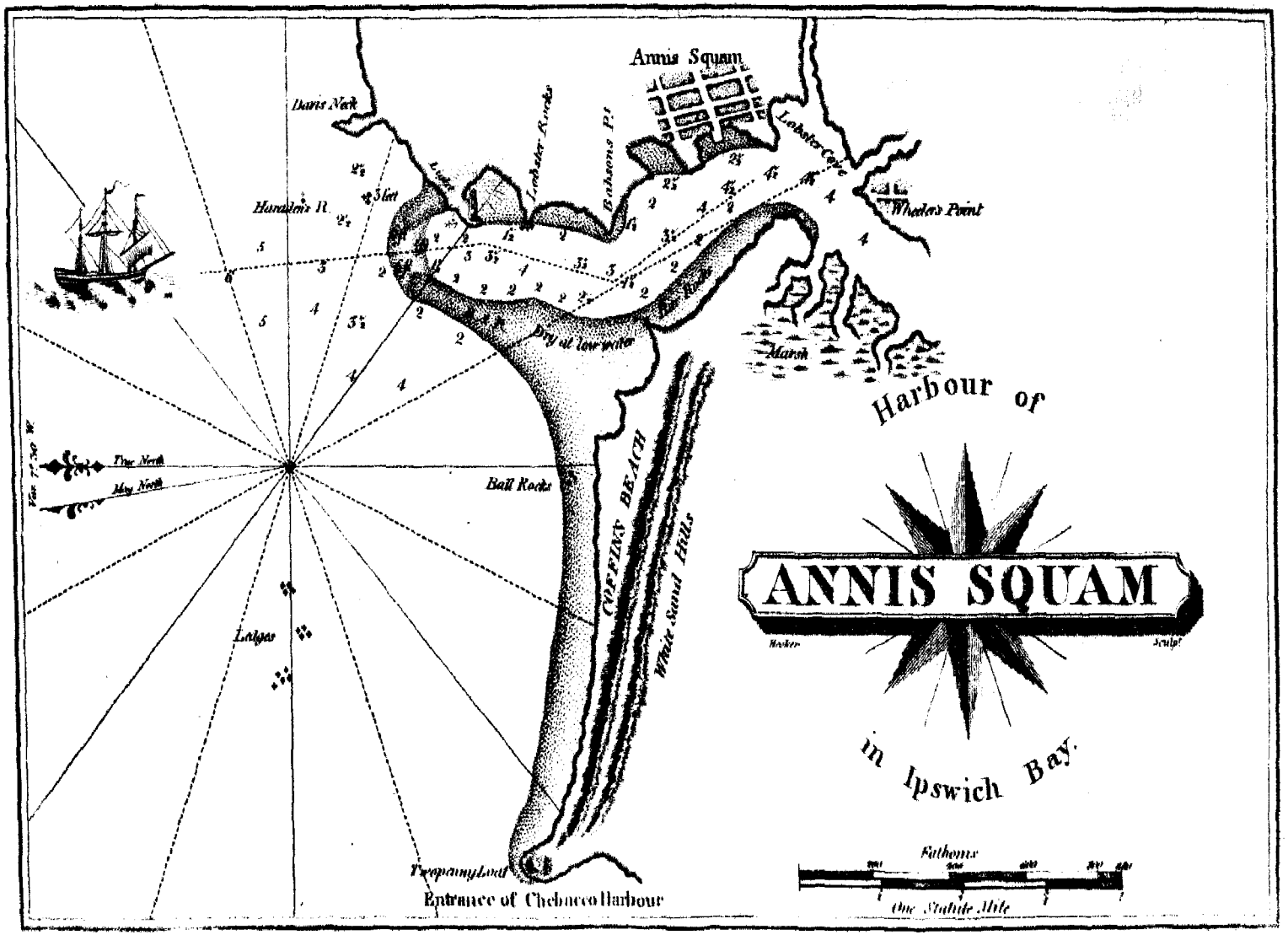

New York. Published by Edmund & George W. Blunt 1841

When a vessel is seen in the bay, and does not come in before night comes on, the following lights will be made, viz:

For a vessel to keep off, and not to attempt to come in over the bar during the night, a lantern will be hoisted to the top of the flag-staff.

When there is a proper time for a vessel to come in over the bar during the night, two lanterns will be hoisted, one at the top of the flag-staff, and the other half mast high. The vessel must then lay off and on at the bar, until a light is made in the eastern light-house, at a window about eight feet below the lantern. The vessel may then come over the bar, keeping the lights in range, and when she gets abreast of the upper light, there is good anchorage.

The signal for a vessel in distress, is a White Square Flag, with a large black ball in the centre, hoisted half mast high.

IPSWICH.—There are two light-houses on Ipswich Beach: they bear from each other W. ¼ N., and E. ¼ S. Keeping the two lights in one will lead over the bar, in the best water, a little to the south of the buoy. Run in close to the beach and follow it close up to, to avoid the northern spit on the starboard hand; run up round the first high bluff head, where will be found safe anchorage. There are 8 feet water on the bar at low water.

The western light at the entrance of Ipswich Harbor is a revolving one, the eastern one fixed.

A canal connects this harbor with that of Gloucester. It is about 120 rods in length, 30 feet wide, and has for its depth about the whole flow of the tide, which is about 12 feet in spring tides, and 8 feet in neap.

ANNIS SQUAM LIGHT-HOUSE is a wooden building, of octagonal form, about 40 feet high, containing a fixed light, elevated about 50 feet above the surface of the water at common high tides. It is painted white, and may be known by being lower than any other light-house on the coast of Massachusetts, and its inland situation. It bears from Portsmouth light-house about S. by W., distant 10 or 11 leagues, and from Newburyport Bar S. S. E., 5 leagues.

ANNIS SQUAM HARBOR, IN IPSWICH BAY.—The masters of vessels out of Newburyport should generally be acquainted with the harbor of Squam; and for their benefit a plan of the harbor has been taken from actual survey, which will be of the greatest importance, when obliged to make a harbor from Ipswich Bay, through stress of weather. When a vessel at anchor off Newburyport Bar, cannot get into port, or parts a cable, with the wind at N. E., or E. N. E., if she can carry double reefed sails, she may run S. S. E. 5 leagues, which course, if made good, will carry her a little to the eastward of Squam Bar; and if the weather is so clear as to see half a mile when you make the land to the eastward of Squam, you may run within a cable's length of the shore; your course is S. S. W.

Squam Bar bears from Hallowboat Point, (the N. E. point of Cape Ann,) from W. S. W. to S. W., distant about 2 leagues. In running from Hallowboat Point, you must be careful of Plumb Cove Ledge, which shows until near high water, and bears from Squam light N. N. E., distant 1½ mile. When you have passed this ledge, you leave a deep cove, called Hodgkin's Cove, and a long point or neck of land, called Davis' Neck, on your larboard hand. When up with this neck, haul S. W., or S. W. by W., for Squam Bar.

Having made Halibut Point, or Folly Cove Point, bring either of them to bear south from a quarter to half a mile distant from them. Then run W. S. W. until you bring the light to bear S. If you judge there is sufficient water on the bar, you will then run for the light: you will pass between the two buoys. The white one is on Harraden's Rock, which you will leave on the larboard hand. The black one is on the north spit of the bar, which you will leave on the starboard hand. You may pass close to either of the buoys; when you have passed the black buoy 20 or 30 rods, you may run S. by W. half W., which will carry you close along by the monument on the Lobster Rocks, which you must leave on the larboard hand, and pass on until abreast of Babson's Point; then a S. S. E. course will bring you into the harbor. If it is so dark that the buoy cannot be seen, continue your south course until within 60 yards of the light, then your course must be S. S. W., which will carry you abreast of Babson's Point, on your larboard hand, and opposite the Dry Bar Rocks, on your starboard hand, then S. S. E., as before directed. The bar has 6 feet of water at low tide. If you should judge there is not water enough on the bar to carry your vessel over safe, you will come to outside of the bar, and hoist a signal for assistance, which will come off if possible; if not, a flag will be hoisted near the light-house, when there is water enough on the bar for a vessel to run in safely.

On the Lobster Rocks is a Monument, 12 feet at the base, 17 feet high, built of stone, and is 7 feet out at high water. The light-house on Wigwam Point bears from the Monument N. E. by N. ½ N., distant one-quarter mile; the Black Buoy placed outside the bar bears N. ¼ E., distant 1¼ mile; the White Buoy near the Harraden Rocks bears N. by E. ½ E., distant 1¼ mile; leaving the White Buoy on the larboard hand, you may

steer direct for the Monument, course S. by W. ½ W. The channel abreast of the Monument is about 45 fathoms wide; the Monument, going in, is left on the larboard hand, and may be approached at three fathoms distant, and then have two fathoms at low water; the Black Buoy, just without the harbor, lies in 10 feet at low water, and bears from the light-house N. ¼ W., and is to be left on the starboard hand; the White Buoy lies in 10 feet water off the N. W. side of Harraden's Rocks, bearing from the light-house N. by E. ½ E., distant one mile, which is to be left on the larboard hand. A red buoy is placed off the Plumb Rock Ledges, in three fathoms water, and bears from Squam light N. N. E., distant 1½ mile. On Squam Bar, at low water, are about 6 feet. High water, full and change of the moon, at 11 o'clock.

SANDY BAY PIER.—If from the southward, in passing outside Streightsmouth Island, be careful of Avery's Rock, which bears north from the eastern part of Streightsmouth Island, about one-third of a mile distant. Run W. by N. until you bring the meeting-house to bear S. W. by S., then run in for the Pier Head, in approaching which keep away a little, and run in until you can see into the Pier Pool; then luff and run in. Those constantly in the habit of entering said Pool when the wind is eastwardly, make up the headsails and keep up the mainsail, which enables them to have command of the vessel, and avoid falling against the wharf built out from the beach. If from the northward, after having passed Andrew's Point, bring the meeting-house to bear S. S. W. and run for it. This course will carry you clear of Dodge's Ledge, which you will leave on the starboard hand.

The passage through Streightsmouth Gap is not safe, except at nearly high water, as there are but three feet water at low tide, and rocky bottom.

CAPE ANN LIGHT-HOUSES are built on Thatcher's Island, which lies about two miles east of the south-east point of Cape Ann, and forms the northern limits of Massachusetts Bay. The lanterns are elevated about 90 feet above the level of the sea, and contain fixed lights.

Thatcher's Island Ledge bears from the body of the island from E. S. E. to S. S. E., extending about two miles from the island. After getting the west light to bear N. ½ W., you are to the westward of the ledge: then haul to the N. W. to bring the lights to bear N. E. by E., and steer S. W. by W. for the eastern point, which is about 7½ miles distant from Thatcher's Island. Then your course is W. by S., distant 7½ miles, for the lights on Baker's Island.

CAPE ANN.—When you come from the eastward, and make Cape Ann lights in the night, bring them to bear S. W., and run direct for them, which course will carry you within the Londoner, and when you pass the said rocks, bring the two lights in one, at which time they will bear N. by E. ¾ E., and then steer S. S. W. ¼ W., keeping said course about one mile, which will carry you clear of Milk Island, which is very low, and cannot be seen in a dark night. When you judge yourself to the westward of said island, you haul to the westward until you bring the lights to bear E. N. E., when you must steer W. S. W. about 5 miles, which course will carry you to Eastern Point. When you pass said point, keep your course W. S. W. until you bring Norman's Woe, which is the highest land on the north side of the harbor, to bear N. N. W., then run N. N. W. till you shut the lights in, then N. N. E. will carry you safe in.

If you want to go inside the Salvages, keep close aboard Hallowboat Point, which has a tree on the eastern part of it, and steer S. S. E. for Streightsmouth Island, but be careful to avoid Avery's Rock, by keeping the lights on the dry point of Streightsmouth Island, till you get up close aboard, then haul round the point, and S. S. E. will carry you to the lights. To avoid the Londoner, you must keep the lights close aboard the body of the island on which they stand; the Londoner lies half a mile off, breaks at all times of tide, is quite dry at low water, and bears E. S. E. from the middle of Thatcher's Island. A long shoal runs off N. E., half a mile distant from the Londoner. Between the Londoner and Thatcher's Island there are 3 fathoms at low water. From the Salvages to Hallowboat Point and Sandy Bay, there lies a large spot of flat ground, which at low water will take up a small vessel. Outside the Salvages is very bold. Hallowboat Point bears from the Salvages W. N. W., 2½ miles distant, and the Salvages bear from the lights N. N. E., 3 miles distant.

In sailing from Cape Ann lights to Cape Ann Harbor, you will first open Brace's Cove, before you come up with the harbor, which will, when open, bear N. N. W., which you must avoid. Cape Ann Harbor lies one mile farther to the westward, and when open, bears N. N. E.

Ten Pound Island lies in the harbor of Cape Ann. There is a light-house on it, containing a fixed light, 45 feet above the level of the sea.

TEN POUND ISLAND LIGHT-HOUSE.—Vessels bound for Cape Ann Harbor, and falling in to the eastward of the eastern point, on which a light-house is erected, containing a fixed light, must give the point a berth of about one mile, and when the light on Ten Pound Island bears N. N. E., are then to the westward of the ledge, that extends off from the point, on which is a spar buoy, the head painted red, in 10 feet water

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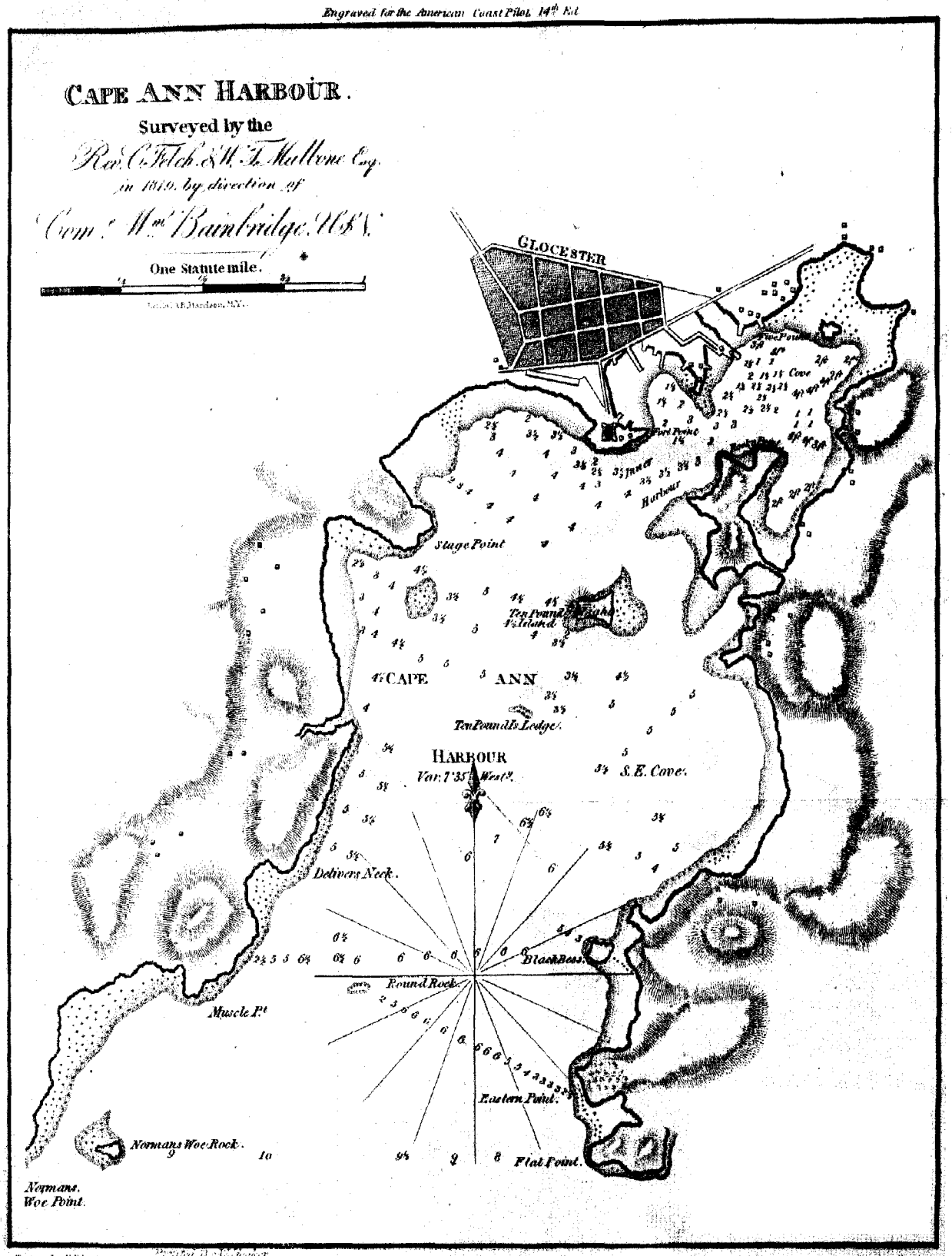

Drawn by E. Blunt. Printed by J. Hatcher. Published by E. & G.W. Blunt, New York. 1841. Plate Engr.d by Rad.

at low water, bearing from Ten Pound Rock E. ½ S., and may steer direct for the light: this ledge bears from the light on Ten Pound Island S. by W. ½ W., and is about half or three-quarters of a mile from the shore. Running this N. N. E. course, will carry them between Ten Pound Island and Ten Pound Ledge, which bears from the light S. W. ½ W., about two-thirds of a mile distant, has but 6 feet water at low spring tides, and is about 10 fathoms diameter. Passing between the island and the ledge, you will have 13 to 15 feet water at low spring tides; the east end of Ten Pound Island is foul ground, and no safe passage: the south, west, and north sides are bold, and may be approached within 40 to 60 fathoms at low water; give the west end of the island a berth of 50 to 70 fathoms, and steer in for the inner harbor N. E., you may anchor at any distance from 100 fathoms to three-quarters of a mile from the island; the light will then bear from S. to S. W. Anchor in 6, 5, 4, or 3 fathoms, spring low tides, muddy bottom; this inner harbor is safe against all winds that blow.

Bound for Cape Ann Harbor, and falling in to the westward, as far as Half-way Rock, take care not to bring the light on Ten Pound Island to bear to the eastward of N. E. by N., until you are a mile or a mile and a half to the eastward of Half-way Rock, to avoid the S. E. breakers that extend from Baker's Island, and which bear from the lights on Baker's Island S. E. ½ S. to S. S. E. ½ E., and about 2¼ miles distant. On the S. E. part of these breakers is placed a spar buoy, painted black, bearing from Half-way Rock N. E. by E., about one mile distant, and from the lights on Baker's Island S. S. E. ½ E., 2¼ miles. When passed to the eastward of these breakers, you may then bring the light on Ten Pound Island to bear N. E., and run for it; on this course you will leave Ten Pound Ledge on your starboard hand, and the ledges off Norman's Woe Rock and Fresh Water Cove on your larboard hand; when up with Ten Pound Island, anchor as above directed.

Baker's Island lights bear from the monument W. by S. ½ S., distant 7 miles; south point of Kettle Island, W. ½ S., distant 4 miles; Half-way Rock, S. W. by W., 7½ miles; light-house on Ten Pound Island, N. ¾ E., distant 1¼ mile; the white buoy on the west end of Dog Bar, W. N. W., half a mile.

The outer harbor of Cape Ann is safe and good anchorage against a northerly or east wind, where you may anchor in 7½ to 6½ fathoms, low tides, muddy bottom, the light-house bearing about S. E. by E., distant about one mile, or a mile and a half.

The S. E. harbor is also safe and good anchorage against a northerly, east, and to the south-east winds: bring the light to bear from N. by E. to N. N. W.; anchor in 9, 8, 7, or 6 fathoms, at low spring tides, muddy bottom, distant from the light one-eighth to half a mile.

Gloucester Canal, which connects the harbor with Squam River, passes immediately by the west part of the town, or what is called the Harbor Parish. It is about 120 rods in length, 30 feet wide, and has for its depth about the whole flow of the tide. It was excavated at low water mark, spring tides; say in spring tides 12 feet, neap tides 8 feet.

LEDGES OFF TEN POUND ISLAND, Bearings, &c., viz.—The ledge that makes off from the eastern point, bears from the light S. by W. ½ W., about 2 miles distant, and has from 6 to 10 feet water at low tides; this ledge lies off from the eastern point about half a mile.

There is a single rock that lies about midway between the eastern point and Norman's Woe, called the Round Rock, on which is a spar buoy, in 2¼ fathoms, low water. The head of this buoy is painted black, and bears from the light-house on Ten Pound Island, S. W. ½ S., distant 1⅛ mile. Round Rock and Ten Pound Ledge bear from each other S. S. W. ¾ W., and N. N. E. ¾ E. Ten Pound Rock and Cove Ledge bear W. ½ N., and E. ½ S. from each other. Round Rock and Cove Ledge bear S. by W. and N. by E. from each other.

A spar buoy is placed on Cove Ledge, or Old Field Rocks, in two fathoms at low water. The top is painted black, and it bears from the light-house W. by S., half a mile distant.

A spar buoy is placed on the west end of Dog Bar Ledge, with the top painted white, in two fathoms at low water, common tides, bearing from the light-house on Ten Pound Island, S. by W. ½ W., distant 1¼ mile; Dog Bar and Ten Pound Ledge Buoy bear N. ¼ E., and S. ¼ W.; Dog Bar and Round Rock N. W. by W. ¼ W., and S. E. by E. ¼ E.; Dog Bar and Cove Ledge S. by E. ¼ E., and N. by W. ¼ W.

The shoal called Round Rock, is a shoal formed by large and small popple stones, and always the same uniform depth of water on it, as before mentioned. Dog Bar consists of large rocks.

About 30 fathoms off from Norman Woe Point is a large high rock, called Norman's Woe Rock, of 20 to 30 fathoms diameter; and about 100 fathoms off this rock, in a southerly direction, is a ledge that has 7 or 8 feet water on it at low tides. About one-quarter of a mile off from Fresh Water Cove lies a ledge with only 3 feet water, low spring tides, bearing from the light W. ⅓ N., distant 2 miles.

Half-way Rock, and the rock on Ten Pound Island, bear S. W. ½ W., and N. E. ½ E. of each other, distant about 8 or 9 miles.

HALF-WAY ROCK.—This is a high rock of about 30 fathoms diameter, lying S. ¼ E., two miles distant, from Baker's Island lights. It is bold all round, and 40 feet high. A monument is erected upon it, the stone work of which is 15 feet high; above the stone work is a spindle 15 feet high, on which is a copper ball 2 feet in diameter.

SATAN'S, OR BLACK ROCK, is above water, steep to, and bears S. W. by S. from Baker's Island, distant 1⅔ mile, and from Half-way Rock N. W. by W. ¼ W., a mile and one-sixth.

SALEM HARBOR—Vessels inward bound, and falling in with Cape Ann, must observe the following directions, viz.: When abreast of Cape Ann lights, bearing N. N. W., about two miles distant, steer W. S. W. about three leagues, which will carry them up with the eastern point of Cape Ann, then steer W. by S. ½ S., 7½ miles, which will carry them up with the lights on Baker's Island.

Ships bound to Salem, falling to the southward, and running for the lights, must, when they have made them, keep the northern or lower light open to the eastward of the southern light, and run for them, which will carry them to the eastward, and clear of the south breaker of Baker's Island, which bears from the lights S. E. by S., 2¼ miles distant, and is very dangerous.

BAKER'S ISLAND lies on the south side of the principal entrance of Salem Harbor, is about a third of a mile in length, from north to south, bearing E. from Fort Pickering, distant about 5 miles, east from the town of Salem. There are now two separate light-houses on Baker's Island, the bases of which are about 45 feet above the level of the sea. One is 72 feet, and the other 81½ feet high, and bear from each other N. W. ¼ W., and S. E. ¼ E. The southern light is the highest. The water is deep near the island, but there is no convenient landing-place. The north and east sides are high and rocky. There is a small channel between the south rocks and the dry breakers, but it is safe only to those who are acquainted with it.

MISERY ISLAND lies from Baker's Island about one mile, is joined by a bar to Little Misery, which makes the north side of the channel opposite Baker's Island. Misery Ledge has 8 feet water at low spring tides, and bears from the light-house N. W. by W. ¼ W., 1¼ mile distant. Misery Island, or Great Misery, is 174 rods in length, from north to south, and 96 rods in breadth. Little Misery is 40 rods in length, with its most western point projecting into the channel. South part of Little Misery Island bears from the lights N. W. ½ N., three-quarters of a mile distant.

The Haste Rock is a broken rock above water, lying near the channel, bearing from Baker's Island lights W. ½ N., distant 2½ miles, and 1⅓ mile from Salem Rock.

Hardy's Rocks (on which a beacon is erected) bear W. ¾ N. from Baker's Island lights, distant five-eighths of a mile. They are covered at high water, and are dangerous. At half tide they appear with 7 feet on them at low water. Rising States Ledge bears W. ¾ N. from them, 150 fathoms distant.

Bowditch's Ledge, on the east end of which a triangular monument of granite, 32 feet high, is placed, in 2½ fathoms, bears from Baker's Island light-house W. N. W., 1¼ mile distant, and is seen at low spring tides.

Cat Island is situated about S. W. by W. from Baker's Island, 2 miles distant, and about 1¼ mile from Marblehead Neck, and ranges from Baker's Island just clear of Marblehead Neck. On the N. W. end is a high beach, directly opposite the point of Marblehead, called Peach's Point. The shore is irregular and rocky. Beyond, and in a line with the island, are two other heads, of nearly the same projection; and on the southern side are three high rocks, but not so large as the former. Two of them are connected with the island by bars of sand, out of water at the ebb; the other stands boldly up within these two, but more southerly. The Marblehead Marine Society has erected on Cat Island Rock a spar, 40 feet high, to the top of which is annexed a cask of about 130 gallons measure, which is seen at sea 20 to 30 feet above the land. A black spar buoy lies off the S. E. end, bearing from the lights S. E. ½ S. to S. S. E. ½ E., 2¼ miles distant.

Eagle Island is about 1¾ mile from Peach's Point, and bears from the light-houses W. by S. ½ S., distant 1½ mile. A bar runs off from the western point of this island in a N. W. direction, half a mile distant, and has a red spar buoy on the end of it. It may be avoided by keeping Gray's Rocks to the southward of Marblehead Fort.

Winter Island lies on the north side of the entrance of Salem Harbor, about half a mile in length; the highest part is on the south of the island, opposite a point of rocks on the neck, (which is a point of land running north-easterly from the town, about one mile.) It has a store and a wharf on the southern end, at the entrance of Cat Cove. On the eastern point stands Fort Pickering.

The Brimbles bear S. W. by W. from the light-house, distant 1½ mile, S. S. E. from Eagle Island, nearly half a mile distant. They are sunken rocks, bare at low water: near to it is a spar buoy, painted red. It comes out of water at half ebb.

Coney Island is a small island that lies near the mouth of Salem Harbor: it bears from Marblehead Point N. E., one mile distant; from Fort Pickering, on Winter Island, E. $\frac{1}{4}$ S., two miles distant; and from Baker's Island light W. $\frac{1}{4}$ S., $2\frac{1}{2}$ miles distant.

Marblehead Rock bears S. W. from the western part of Cat Island, distant three-fourths of a mile. It is above water, and may be approached on either side, very near, with safety.

Gray's Rock bears N. W. from Cat Island, distant three-quarters of a mile, W. by S. $\frac{1}{2}$ S. from the light-house, distant $2\frac{1}{8}$ miles, is high out of water, and may be approached with safety.

Vessels bound to Salem, having made the lights with a westerly wind, in beating up, must not stand to the southward or westward, further than to shut one light in with the other, on account of the south breaker, nor to the northward, further than to bring the lights to bear W. by S. $\frac{1}{2}$ S., on account of Gale's Ledge, which bears from the lights N. E. by E. $\frac{3}{8}$ E., $1\frac{1}{4}$ mile distant, having but 4 feet water at low tides.

In going into Salem by the common or ship channel, between Baker's Island and Misery Island, being up with Baker's Island, you may pass within 100 fathoms of it and steer W. by N. for the Haste; this course will carry you clear of Hardy's Rocks, leaving them to the southward, and will leave Bowditch's Ledge to the northward. If you are in the mid-passage, between Baker's Island and the Misery, you may steer W. N. W. till you have passed Bowditch's Ledge, or till you get Cat Island open to the westward of Eagle Island, then haul up for the Haste. Any stranger may there anchor in safety, in about 5 fathoms of water, good anchorage; but if you choose to proceed into Salem Harbor, you must steer about west for the Haste, which you will leave on your larboard hand, about half a mile distant, then steer S. W. by W., which will carry you into Salem Harbor, but you must observe, that there is a ledge runs off from the N. E. end of Winter Island, and that Abbot's Rock lies abreast of it; to avoid which you must keep above a quarter of a mile from the shore. Abbot's Rock is found by bringing Castle Hill and house into the cove north of Fort Pickering, and Beverly Meeting-house well in with Juniper Point (or S. E. point of Salem Neck.) Abbot's Rock has seven feet at common ebb. The mean of common tides is 12 feet. In keeping off shore, to avoid Abbot's Rock, you must not go too far off, for fear of the Aqua Vitæ, which are sunken rocks, lying E. S. E. from Fort Pickering, distant nearly half a mile.

When coming from the southward, if you are near Cat Island, you may pass to the eastward or westward of it; if you are to the eastward, you must give a berth of a quarter of a mile, and steer N. by W. $\frac{1}{2}$ W. or N. N. W., leaving the Brimbles and Eagle Island to the starboard, and Coney Island Ledge to the larboard—that course will carry you clear of Eagle Island Bar; continue upon the same course till you have passed the Haste, and get into common ship channel, or you may continue the same course till you get under the north shore, where there is good anchorage.

If you are to the westward of Cat Island, you may pass in the middle channel between that island and Marblehead Rock, and steer over north for the ship channel, leaving Gray's Rock and Coney Island to the westward. After passing the Haste, and entering the ship channel, you may proceed as before directed.

If in coming from the southward and eastward, you should find yourself near Half-way-Rock, you may bring it to bear S. E. and steer N. W. for the Haste, passing near to Satan or Black Rock, leaving it on the larboard hand, and the Brimbles and Eagle Island on the starboard; continue this course, and you will leave the Haste on the larboard hand, enter the common ship channel, and proceed as above.

There are several other channels for entering Salem Harbor, but they ought not to be attempted without a pilot

BEVERLY AND MANCHESTER.—To enter Beverly Harbor, follow the directions for Salem Harbor, till you bring the Haste to bear E. S. E. and run W. N. W. about two miles, and you reach Beverly Bar, which is a spot of sand running out from the southern or Salem side of the entrance, and has commonly a beacon upon the head of it, above a quarter of a mile from the shore. The bar has very shoal water on the eastern or outward side near it, but good anchorage within. There is good water at the head of the bar. Having passed the bar, there is a sandy point from Beverly, on the northern side of the entrance, and beyond this point are the Lobster Rocks, which bear from the head of the bar W. a little S., and not half a mile distant, and they are above water at half tide. To avoid this point, after having well cleared the bar, you will steer towards Ram-horn Rock, which has also commonly a beacon, and is to be seen at half tide, bearing S. W. by S. from the head of the bar, one-eighth of a mile distant. There are several fathoms of water within a vessel's length of Ram-horn Rock. Giving this a good berth, you then clear the sandy point, and steer for the Lobster Rock Beacon, bearing from Ram-horn Beacon N. W. by W., distant about one-quarter of a mile. Giving this a good berth, you are then opposite to the wharves, and may anchor in deep water, in a very safe and excellent harbor.

To enter Manchester Harbor, you must bring the southern light on Baker's Island to bear S. ½ E., and run N., one mile distant, where you may anchor on good bottom.

Eastern Point bears from Baker's Island lights E. by N. ½ N., 7½ miles distant. Half-way Rock bears from the lights S. ¼ E., 2 miles distant. Hardy's Rocks bear from the lights W. ¾ N., distant five eighths of a mile.

MARBLEHEAD.—Vessels bound to Marblehead, and falling to the southward, and running for the lights, after making them must keep the north and lower one open to the eastward of the southern light, and run for them, which will carry them to the eastward and clear of the south breakers off Baker's Island, which bear from the lights from S. E. ½ S. to S. S. E. ½ E., distant two miles and one quarter.

Having made the lights with a westerly wind, and beating, when within two and a half miles of them, you must not stand to the southward and westward so far as to shut the north light up with the south light, on account of the south breakers, nor to the northward further than to bring the lights to bear W. by S. ½ S., on account of Gale's Ledge, which bears from the lights N. E. by E. ⅛ E., distant 1⅓ mile. Drawing near to the lights, take care of a ledge, called the Whale's Back, which bears from the lights N. by E., distant four-fifths of a mile, and comes out of water at quarter ebb.

In going into Marblehead, and being up with the lights, give the north point of Baker's Island a berth of one-quarter of a mile or less. Having the lights one in with the other, you are up with the point. When the south light is open with the north light, you have then passed the point, (leaving the Misery Island on your starboard hand, which bears from the lights N. W. ½ N., three-fourths of a mile.) Then steer S. W. by S. or S. S. W. until you bring the south light to bear N. E. by E. ½ E.; then steer S. W. by W. ½ W., distant 3 miles, for Marblehead Harbor. You will leave Hardy's Rocks, Eagle Island, and Gray's Rock, on the starboard hand; Pope's Head, (which is a large high rock, bearing S. W. by W. from the lights, two-thirds of a mile distant,) Brimbles, and north point of Cat Island, on the larboard hand. The Brimbles bear from Eagle Island S. S. E. ½ E., distant half a mile; and Gray's Rock from the north point of Cat Island, N. W. by W. seven-eighths of a mile.

Falling in with the south point of Baker's Island, and it blowing hard from the eastward, if you cannot avoid it, you may pass the point by keeping it well on board, say at the distance of from 20 to 50 fathoms from the shore, where you will have from 4 to 5 fathoms water. When up with the S. W. point, steer W. S. W., which will carry you between the north Gooseberry Island (which bears S. W. ½ S. from the lights, distant two-thirds of a mile) and Pope's Head, leaving the former on your larboard hand, and Pope's Head on your starboard hand, between which you will have from 3½ to 5 fathoms of water. As soon as you have passed Pope's Head, haul to the northward, until the south light bears N. E. by E. ½ E., then steer S. W. by W. ½ W. for Marblehead Harbor.

The south entrance of the Harbor of Marblehead is bold, and may be approached with safety with the light on the point of the neck at the S. E. side of the harbor, bearing from N. N. W. to W. by N. until you are within half a mile of it; then bring the light to bear W. by S. and run for it until within two cables' length; then steer N. W. by W. until the light-house bears S. S. W.; then steer S. W. and anchor with the light bearing from E. by S. to N. E. by E. from a quarter to a half a mile distant, in 6 fathoms, good holding ground and clear bottom, secure from all but easterly gales. The following are the bearings from the light-house.

Marblehead Rock	S. E. by E. ½ E.	distant	¼	mile.
Half-way Rock	E. by S.	"	2½	do.
Cat Island Rock	E. ¼ N.	"	⅞	do.
Baker's Island Light	N. E. by E.	"	3	do.
Hardy's Rocks	N. E.	"	2½	do.
Eagle Island	N. E. ¼ N.	"	⅞	do.
Gray's Rock	N. E. by E. ½ E.	"	1	do.
Peache's Point	N. by W. ½ W.	"	1	do.
Fort Head	N.	"	½	do.

The above are by compass.

Vessels coming from the eastward, and running for Half-way Rock, (described in page 160,) must not bring the rock to bear to the southward of W. S. W., to avoid the south breaker, which bears from Half-way Rock N. E. ½ E., distant one mile. Being up with Half-way Rock, and bound into Marblehead, bring the rock to bear E. by S. ½ S. and steer W. by N. ½ N. for Fort Head, distant 3 miles, leaving Cat Island on the starboard hand, which bears from Half-way Rock W. N. W., distant 1¾ mile, and Marblehead Rock on the larboard hand, which bears from Half-way Rock W. ¾ N., distant 2 miles. Black Rock bears from Half-way Rock N. W. by W., distant 1½ mile. Cat Island Rock and Point Neck bear east and west of each other, distant about one mile.

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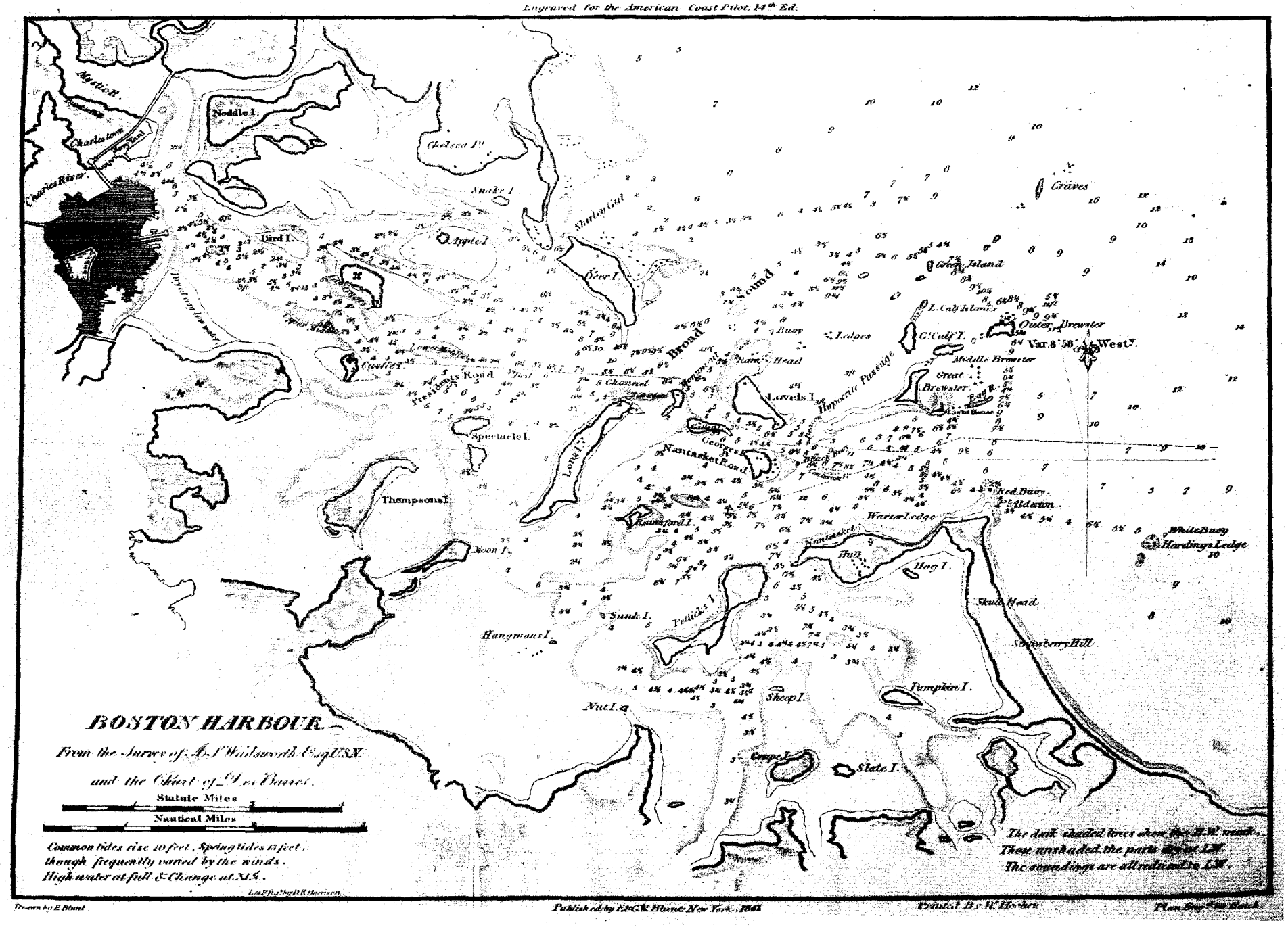

Drawn by E. Blunt

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Vessels being up in Boston Bay, may, by bringing Boston light to bear S. S. W. run N. N. E. for Marblehead Rock: they are distant from each other about 12 miles. Half-way Rock and Boston light bear from each other S. W. and N. E., distant 15 miles.

Hardy's Rocks are covered at high water, and may be seen at quarter ebb. Whale's Back is covered at high water, and may be seen at quarter ebb. Gale's Rocks have but 4 feet water at low tides, and bear N. E. by E. $\frac{1}{8}$ E. from the lights, distant $1\frac{3}{4}$ mile. The south breakers, off Baker's Island, are always covered. The Brimbles are covered at high water, and are seen at half tide. Black Rock is always out of water, but low. Cat Island Rock, Half-way Rock, Marblehead Rock, Gray's Rock, and Pope's Head, are large, and high above water. Half-way Rock is very bold all round it. Eagle Island is bold only on the south and east; from the N. E. part of it, quite to Hardy's Rocks, is very shoal water, and no passage for ships.

Bearings and distances of the Principal Islands, Rocks, &c., in the vicinity of Salem, from Baker's Island Lights.

The lights bear from each other N. W. $\frac{1}{4}$ W. and S. E. $\frac{1}{4}$ E., 40 feet distant.

Eastern point of Cape Ann bears	E. by N. $\frac{1}{2}$ N.,	$7\frac{1}{2}$	miles distant.
Gale's Ledge, which has a white spar buoy on the S.W. end, and on which are 3 feet water, low tide,	N. E. by E. $\frac{1}{8}$ E.,	$1\frac{3}{4}$	do.
House Island, at the mouth of Manchester Harbor,	N. N. E.,	1	do.
Saube's Ledge, in Manchester,	N. $\frac{1}{2}$ W.,	$\frac{3}{4}$	do.
East part of Whale's Back,	N. by E.,	$\frac{3}{4}$	do.
Pilgrim's Ledge, (13 feet low common tides,)	N. E.,	$1\frac{1}{3}$	do.
Great Misery,	N. by W. $\frac{1}{4}$ W.,	1	do.
Misery Ledge, (has 8 feet at low tides,)	N. W. by W. $\frac{1}{2}$ W.,	$1\frac{1}{4}$	do.
South part of Little Misery,	N. W. $\frac{1}{2}$ N.,	$\frac{3}{4}$	do.
Whale's Back, (comes out at two-thirds ebb,)	N. by E. $\frac{1}{2}$ E.,	$\frac{3}{4}$	do.
Bowditch's Ledge,	W. N. W.,	$1\frac{1}{4}$	do.
North part of Hardy's Rocks,	W. $\frac{3}{4}$ N.,	$\frac{5}{8}$	do.
North part of Haste Rock,	W. $\frac{1}{2}$ N.,	$2\frac{1}{2}$	do.
South part of Coney Island,	W. $\frac{1}{4}$ S.,	$2\frac{1}{2}$	do.
Nagus Head, or Marblehead shore,	W. $\frac{1}{2}$ S.		
Gray's Rock,	W. by S. $\frac{1}{2}$ S.,	$2\frac{1}{8}$	do.
North part of Eagle Island,	W. by S. $\frac{1}{2}$ S.,	$1\frac{1}{2}$	do.
South part of Marblehead Neck,	S. W. by W. $\frac{1}{4}$ W.		
North part of Cat Island,	S. W. by W.,	2	do.
Middle of Pope's Head,	S. W. by W.,	$\frac{2}{3}$	do.
North part of Western Gooseberry,	S. W. $\frac{1}{2}$ S.,	$\frac{2}{3}$	do.
South Gooseberry,	S. S. W. $\frac{1}{2}$ W.,	$\frac{7}{8}$	do.
Satan, or Black Rock,	S. W. by S.,	$1\frac{2}{3}$	do.
Eastern Gooseberry	S. S. W. $\frac{1}{2}$ W.,	$\frac{3}{4}$	do.
Half-way Rock	S. $\frac{1}{4}$ E.,	2	do.
South Breakers of Baker's Island	S. E. by S.,	$2\frac{1}{4}$	do.
Archer's Rock, on which is a spar buoy, painted red, (has 7 feet at low tides)	S. W. by W. $\frac{1}{2}$ W.	$2\frac{1}{8}$	do.

Outer breakers, known generally by the name of Outer, Middle, and Inner Breakers; this is a very extensive and dangerous shoal, extending from Searl's Rocks, in a S. E. direction, about two miles, and in a westerly direction about three-quarters of a mile, bearing from the lights S. E. $\frac{1}{2}$ S. to S. S. E. $\frac{1}{2}$ E., two and a quarter miles; to pass to the eastward of this dangerous shoal, have the northern or low light a little open to the eastward of the high light.

Searl's Rocks, a small part comes out of water at low spring tides, and bears from the south light, S. E., three-eighths of a mile distant, and from the S. E. points of Baker's Island, S. E., distant a small one-fourth of a mile. There is a good channel between the island and Searl's Rocks, by keeping the island best on board, say at the distance of 30 to 40 fathoms; in this channel are 3 to 5 fathoms water, at low common tides.

BOSTON LIGHT-HOUSE is situated on the Little Brewster Island, on the north side of the entrance to the harbor. The light is a revolving one, and is 82 feet above the level of the sea.

LONG ISLAND LIGHT, on the N. E. point of Long Island, is on a tower of 20 feet, with a lantern 7 feet high, bearing from Boston light W. $\frac{1}{8}$ N.

BOSTON HARBOR.—From Cape Ann to Boston light-house, the course is S. W. $\frac{1}{4}$ S., distant $8\frac{1}{2}$ leagues. After making the light, with the wind fair, you will bring it to bear W. by N. or W. N. W. and then run for it, till you come within 2 cables' length of it. If the weather is bad, and you cannot get a pilot from the light-house, after running abreast of it so as to bring it to bear N. by E., you may run W. by S. 2 miles, until the light on Long Island Head bears N. W. by N.; then steer N. W. about one

mile, or until the old light is hid by George's Island, where you may anchor in from 7 to 5 fathoms, in safety, in Nantasket Road.

The main entrance into Boston Harbor lies between Light-house Island on the north side, and Point Alderton on the south, (off which lies a shoal, as described in the PLATE, to which the reader is referred.)

To work into Boston Bay, you may stand to the southward till you bring the light to bear W. N. W., and to the northward till you bring it to bear W. S. W., till you come within one league of the light; then you must not stand to the northward any further than to bring it to bear W. by N., and to the southward to bring it to bear W. N. W. You may anchor in the bay with safety if the wind is off shore. If you fall to the southward of Boston Harbor, be careful to avoid Cohasset Rocks, which lie above water some distance from the land, say from 1½ to 2 miles; the outer part of which, called Minot's Rock, has a black buoy on it, that lies in 5 fathoms water, which you leave on your larboard hand. This rock comes out of water at low common tides, and bears from Boston light-house S. E. ¼ E., 9 miles. Your course from this buoy to the light-house is N. W. by W., distant 3 leagues. N. N. E. from Minot's, four miles distant, lies a ledge of rocks, which is small and bold; near it you have 20 fathoms. In running the above course and distance, you will pass a white buoy which lies in 4 fathoms water, that is on the N. E. part of Harden's Rocks, and bears S. E. ½ S. from the light-house, distant 1½ league, which rocks may be seen two hours before low water, that you also leave on your larboard hand. There is another buoy on your larboard hand, which is red, that lies in 3 fathoms water on *Point Alderton. When in the middle of the †light-house channel, steer W. by N. one mile distant, to the beacon on the Spit, which you may run within one-quarter of a cable's length of, leaving it on your starboard hand, opposite to which lies a black buoy in 2 fathoms water, on George's Island Rocks. Between the light-house and George's Island lies a rock, having a black buoy on it, called the Centurion, in mid-channel, with 14 feet water on it, bearing from the light-house W. S. W. Your course from this to Gallop's Island Point, is N. W. by N., half a mile distant. From thence through the Narrows, by Nick's Mate, your course is N. N. W., half a mile distant. Nick's Mate has a monument on it, and must be left on your larboard hand, one cable's length distant, and then steer W. by N. for Castle Island, distant 4 miles. In running W. by N. from Nick's Mate, you will first leave a white spar buoy on the Lower Middle, on your starboard hand, distant 3 miles from Nick's Mate; then, three-quarters of a mile distant, you will see a white buoy, which is on the Castle Rocks, in two fathoms, which you leave on your larboard hand. When abreast of the Castle, steer N. N. W. one-quarter of a mile, to clear the Upper Middle Ground, which has a black buoy on it in 2 fathoms water, that you leave on your larboard hand; if the buoy should be removed, run N. N. W. till you bring the two northernmost steeples in Boston a handspike's length open, then steer N. W. by W. 2½ miles, which will carry you opposite the town.

Broad Sound, which is the north entrance of Boston Harbor, is not a proper channel for large vessels; but those who frequent it, will follow the directions here given: when up with the Graves, which are a parcel of dry rocks that appear white, you must leave them on your larboard hand, two cables' length distant, then bring them to bear S. E., and run S. W. by W. 4 miles, when you will be up with Long Island light. You leave it on your larboard hand.

In passing from the Graves to Long Island light, you will see two buoys on your larboard hand, one of which is on a reef called the Devil's Back, is painted red, and lies in 4 fathoms water; the other is on Ram's-head Bar, painted black, and lies in 15 feet water on the N. E. end, bearing from Long Island light E. N. E. You will also pass a white buoy on your starboard hand, which lies on the N. E. point of Faun Bar, in 2½ fathoms, (at which time Long Island head light will bear S. W.) when you must follow the directions above for the town.

A black buoy with a white vane, has been placed near to the Barrel Rock, which lies in the Broad Sound channel, at the entrance of Boston Harbor. The buoy is moored about 7 fathoms N. E. from the rock, in 3½ fathoms water, about 1½ mile W. by S. from the body of the Graves, one half mile N. W. from the Devil's Back, W. N. W. from the house on Green Island, and N. E. ¾ E. from the tree on Long Island Head. This rock

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* *The single rock off the north part of Point Alderton.*—The rock on with the first fence that runs over the east side of Strawberry Hill; Newcomb's Barn (on Gallop's Island) half way between the light-house on Long Island and the beacon on the spit. When Newcomb's barn is on with the beacon, you pass just to the north of this rock, on the north of which the buoy is placed, and near it.

† *Marks for a shoal in Light-house Channel.*—The east low point of Gallop's Island, just seen clear of the N. E. of George's Island; the buoy on the Centurion just clear to the north of the Great Brewster: this is something of a shoal; on it, at low water, are 12 to 13 feet. Mr. Wilson, pilot for Boston Harbor, struck on this shoal in a ship drawing 14 feet 9 inches water. Then the tide had flowed about three-quarters of an hour.

is 10 or 12 feet long, and 5 or 6 feet wide, ranging N. N. W. and S. S. E., having 4 or 5 feet of water upon it at low tide, and 3½ fathoms round it. Vessels may pass with safety either side of the buoy, giving it a berth of 12 or 15 fathoms, but the eastern passage is said to be preferable for strangers.

The Lower Middle Ground lying in the way, the directions are as follows, viz.

The Lower Middle Ground, which lies on the north side of the channel, a little above Spectacle Island, is in part dry at low water. On the eastern part is a red buoy, and on the western part is a black buoy, in two fathoms water, both which you leave on your starboard hand, at which time you may see the white buoy on the Castle Rocks, before mentioned.

Pudding Point, or Shirley Gut Entrance, is between Faun Bar and Winship's Bar. You must bring it to bear S. W. and run for it, leaving Shirley Point on the starboard, and Deer Island on the larboard hand. The channel from this gut to Boston is so crooked and narrow, that no person should attempt to go in with a large vessel, unless acquainted, without a pilot.

In consequence of part of Deer Island's washing away, a shoal has made off from the S. or S. W. point, in about a W. S. W. direction, called the Handkerchief, about 40 or 50 fathoms long, ranging about E. N. E. and W. S. W. It is covered at high water, but dry at very low tides, which makes it dangerous for vessels coming in and going out through Broad Sound. A black buoy is now placed near the point, which must, in passing, be left to the northward, when passing through Broad Sound.

HYPOCRITE PASSAGE.—In coming from sea, you leave the Graves, Roaring Bull, (which lies between the west end of the Graves and the east end of Green Island,) Green Island, and Half-tide Rocks, on your starboard, and the Outer Brewster, Little and Great Calf Island, on your larboard hand. [NOTE.—Half-tide Rocks lie to the west of Green Island, one-third of a mile, and opposite Little Calf Island, distant about half a mile, and come out at half ebb.]

Giving the Graves a berth of one-quarter of a mile, the course up for Little Calf Island's N. E. point is about W. by S., distant 1¾ mile from the Graves. As you pass up, give the south side of Green Island a berth of one-quarter of a mile to avoid a ledge of rocks that runs off from the south side of the Island, about one-eighth of a mile. When nearly up with the N. E. point of the Little Calf, give it a berth of about 40 or 50 fathoms, and after passing it, steer for the north point of the Great Calf Island, from the west end of which the course is S. W., or run up by it, keeping the S. W. head of Pettick's Island open to the west of the beacon on the spit. In passing between Lovell's Island and the beacon on the spit, keep nearest the island, as a ledge of rocks extends from the spit from 60 to 80 fathoms, and comes out of water at half ebb, lying about one third of a mile N. E. from the beacon. There is also a ledge (or rock) lying about midway between the beacon and the S. E. point of Lovell's Island, having 6 feet on it at low spring tides. After passing the beacon, you enter the Narrows. Lovell's Island makes the east side of the entrance to the Narrows.

Marks taken on shore, at the old Light-house.

White Buoy of Harding's Rocks	S. E. ½ S.
Red Buoy on Point Alderton	S. S. E.
Black Buoy on the Centurion	W. S. W.
Black Buoy on George's Island Rocks	W. by S. ¼ S.
S. E. head of George's Island	W. by S. ¾ S.
Beacon on the spit	W. ¾ S.
East head of Pettick's Island	S. W. by W.
Outer rocks of Cohasset	S. E. by E. ½ E.
Light-house on Long Island Head	W. ½ N.

Bearings of sundry places from the East Head of Nahant.

South side of Nahant Rock	N. N. E. ½ E.
Pig Rocks, (south dry rocks)	N. E. ¼ E.
Half-way Rock	N. E. by E.
Tinker's Island (south point)	N. E. ½ E.
Baker's Island Lights	N. E. ½ E.
East end of the Graves	S. by E. ¾ E.
Long Island Light-house	S. W. ¾ S.
North point of Deer Island	S. W.

Vessels outward bound, from Boston light-house, who would wish to fall in with Cape Cod, the course is S. E. by E. ½ E., distant 11 leagues, thence 3 leagues to the light-house. When up with the light-house, and it bears S. W., 2 leagues distant, you may then steer S. S. E., which will carry you out of the south channel.

Vessels in Boston Bay, who put away for Cape Cod Harbor, must endeavor to fall in with Race Point light-house, which contains a revolving light, and run for it until within half a mile; when it bears E. N. E. haul up E. S. E., or as near as the wind will permit, and anchor in from 10 to 4 fathoms, in Herring Cove, where is a good lee, with the wind from N. N. E. to S. E. by E. Should the wind shift to the N. W. Provincetown Harbor is under the lee, to which we refer. Should you first make Cape Cod light, bring it to bear E. by N., and run for it until you have soundings in 14 or 15 fathoms water; then steer N. E. until the light bears E. by S.; then run in N. W. for the harbor. The course from Boston light-house to Sandwich is first S. E. by E. 3 leagues, to Cohasset Rocks; thence to Sandwich S. S. E. 14 leagues.

When between Cape Ann and Cape Cod, you will have 35 to 19 fathoms water, which latter soundings is within 2 leagues of Boston light-house; the quality of the soundings is more to be depended on than the depth of the water, as you will find a difference of 5 or 6 fathoms in running a cable's length. You will observe that the quality of soundings is rough on Cape Ann side, and sandy on Cape Cod.

At full and change, it is high water off Race Point at 10 o'clock and 45 minutes. Vessels in leaving Cape Cod, bound to Boston, should calculate the tide, as the flood sets strong to the S. W. off Cape Cod, from the Race to Chatham; flood sets to the south, ebb to the north; southern tide, 9 hours; northern tide, 3 hours.

The upper buoys in Boston Harbor will be taken up during the winter season; but those in the vicinity, including Salem and Cape Ann, are not taken up during the winter.

BOSTON LIGHT-HOUSE TO CAPE ELIZABETH LIGHTS.—From Boston light-house to Thatcher's Island lights, which lie two miles east from Cape Ann, the course is N.E. ½ N., and the distance 8½ leagues; but to clear the Londoner, which you leave on your larboard hand when bound to Cape Elizabeth, the course is N. E. by E. About half way, and near the north shore, is a high bold rock, called Half-way Rock, of about 30 fathoms diameter, (on which is a monument) bearing S. W. by W., distant 7⅔ miles from the eastern point of Cape Ann, before described.

From Thatcher's Island E. S. E. one half of a mile, lies a ledge of rocks, called the Londoner, which show themselves at half tide, and extend E. N. E. and W. S. W., distant two miles from the island. If you should be forced to the northward of Cape Ann, there is a very clean bay, called Ipswich Bay, and north-east from it lies the harbor of Portsmouth, the entrance to which is formed by Great Island on the west, and Gerrish's Island on the east, on the former of which the town of Newcastle is built.

From Cape Ann lights to the Isles of Shoals, the course is N. ¾ E., distant 6⅔ leagues.

Strangers should never attempt to go round the east end of these islands; but if driven thereto, give them a berth of half a mile, and steer N.W. by N., which will carry you to Portsmouth.

BOSTON BAY, FROM CAPE COD OR CAPE ANN, TO BOSTON LIGHT-HOUSE.—Boston light-house, as before mentioned, stands on a small island at the entrance of the channel, and is about 82 feet high, including the lantern. To steer for it from Cape Cod, when in 5 fathoms, off Peeked Hill Bar, your course is N. W. by W. ½ W. 14 leagues. Should it be thick weather, and you should fall in with the south shore of Scituate in 15 fathoms, steer north till you get into 16 fathoms, when Boston light will bear W. N. W.

From the Race Point light-house to Boston light-house, is about 11 leagues. From Cape Ann lights to Boston light, the course is S. W. ½ S., distant 8½ leagues.

There are two lights on Thatcher's Island. This island contains about 30 acres of land, secured by an iron-bound shore, and is situated about two miles east of the main land of Cape Ann. It affords no harbor, nor is there any safe anchorage very near it. There is a passage between that and the main, through which small vessels may pass even at low tide, but the water is shoal, and the bottom covered by a collection of large round stones. The light-houses were erected there for the benefit of vessels coming in from sea, as well as for those coasting around the shores. As soon as these lights are discovered, they can know their real situation; for being two lights, they cannot be taken for the single revolving light at Boston Harbor, or for the Plymouth lights, where there are also two, but the distance between them is only 11 feet 6 inches, while the distance between those on Thatcher's Island is about one-third of a mile, and can be brought to range one with the other when you are abreast of the island, and bear N. by E. ¾ E. and S. by W. ¾ W. from each other, and those on Plumb Island bear E. by N. and W. by S. from each other. The lights on Thatcher's Island are of great use to all vessels in their passage in or out, as they point out the situation of the Salvages on the north, and the Londoner on the south. Besides, from the different bearings of the lights, a safe departure may be taken for the different harbors in the bay, as well as for those bound northerly and to sea. For remarks more minute, you will find them in the directions for sailing to Boston light, to Baker's Island lights, and to those on Plumb Island, at the mouth of Newburyport Harbor.

SCITUATE.—The light-house at the entrance of Scituate Harbor was erected more

for the benefit of foreigners, who fall into the bay southward of Cohasset Rocks, and as a guide to southern coasters to avoid Cedar Point, which is flat, and projects into the bay beyond the cliffs, than for any advantages to be derived from the harbor, which is small, having only about 12 feet water on the bar at high water, middling tides. Scituate light-house is four miles to the southward of Cohasset Rocks, elevated thirty feet above the level of the sea, showing two lights, one above the other, the lower one red, and the upper one white, distinguishing it from Boston light, on the north, which is a revolving light, and Plymouth lights on the south, which show two lights (or lanterns) on the same building.

From the body of the light-house, the northerly part of Cedar Point, and a ledge called Long Ledge, extends N. N. W. nearly one mile; so that vessels falling in a little more than one mile northward of the light, may bring the light to bear south; and if they make good their course north, they will clear the outer ledges of Cohasset Rocks: half a mile east of the body of the light will clear Cedar Point, Long Ledge, and the first Cliff Ledge.

[NOTE.—There are ledges extending from all the four cliffs, but none between them; and half a mile from the shore will clear all, except frigates and large vessels.]

From the body of the lights, running S. S. E. will clear Branche's Point, consequently, giving the lights half a mile berth, there will be no danger in running S. S. E.

There is a passage within Cohasset Rocks, used by coasters, which is found by giving the lights half a mile berth, and running N. W. by N. to the southerly entering rock.

There is a meeting-house about two miles W. by N. from the lights; and a farm-house near the north-west side of the harbor, with two large barns a little north. To go into the harbor (the mouth of which is about one-third of a mile wide) bring the meeting-house or farm-house to bear about W. by N. from the middle of the entrance of the harbor, and run in W. by N. for the farm-house, until you have passed the bar, which is a hard bed of stones and gravel that does not shift; and after passing the bar, and coming on sandy bottom, haul up and anchor near the beach on the south side of the harbor.

GURNET LIGHTS.—On Gurnet Point, the northern side of the entrance to Plymouth Harbor, there are two light-houses, 86 feet above the level of the sea, 11 feet 6 inches apart, and containing fixed lights, and should not be brought in range when to the northward of them; but to the southward, you may bring them in one, which is a good mark to clear Brown's Island, or sand bank.

PLYMOUTH HARBOR.*—The high land of the Monument bears from the lights S. ¼ W. 3 miles, and Monument point S. S. E. 3 leagues, and Branche's point N. ½ W. about 3 leagues. Saquash Head W. ½ S. 3 miles, the easternmost part of Brown's Islands or shoals that dries, S. S. W. 1¼ mile, and the Gurnet Rock from the body of the light-house E. by S. ¾ S., one-third part of a mile; on this rock you have but 3 feet at low water, at which time all the soundings were taken, and 3½ fathoms along side at the same time. A white buoy is placed near this rock, bearing E. S. E. from the light-house, distant about one-third of a mile. When you have shut in the Sandy Hill with the Gurnet Head, you are clear of the rock; after which you must mind not to haul in too close to the head, as there are many sunken rocks some distance from the shore. When you bring Saquash Head to bear W. by N. you may steer up W. by S., and if you are bound for Plymouth you must keep that course for a large red cliff on the main, which is a very good mark to carry you clear of Dick's Flat; then you must steer more southerly for Beach Point, or run up until you are abreast of Saquash Head, giving it one-quarter of a mile distance; then steer W. by S. ½ S. which will clear you of Dick's Flat, and carry you directly for Beach Point, keeping within 15 or 20 yards of the Sandy Point, steering away for the southward, keeping that distance until you have shut in the lights, where you may anchor in 3 and 4 fathoms, but the channel is very narrow, having nothing but a flat all the way to Plymouth, except this small channel, which runs close by this neck of land; you will have 4 and 5 fathoms close to this point. If you are bound into the Cow-yard, you must steer as before directed, which will clear you of the stone monument on Dick's Flat, and that on the Muscle Bank, both of which you leave on your starboard hand, when you may anchor in 7 or 8 fathoms water. If bound to Kingston, you will keep the house on Gurnet Head just open with Saquash Head, until you have opened the high pines with Clerk's Island; then you are clear of the Muscle Bank, when you may steer N. W. until you have 3 fathoms at low water, not running into less.

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* This harbor is capacious, but shallow, and is formed by a long and narrow neck of land, called Salthouse Beach, extending southerly from Marshfield, and terminating at the Gurnet Head, and by a smaller beach within, running in an opposite direction, and connected with the main land near Eel River, about three miles from the town. On Salthouse Beach is placed one of the huts erected and maintained by the Humane Society of Massachusetts, for the reception and relief of shipwrecked mariners. There is a breach in the inner beach, which exposes the shipping, even at the wharves, during an easterly storm.

In coming from the northward, bound into Plymouth, you must not bring the lights more southerly than S. by W. to avoid High Pine Ledge, which lies north from the Gurnet Head, about 2½ or three miles. When you are on the shoalest part of this ledge, some part of which appears at low ebb, you will have the high pines in range with Captain's Hill, which will then bear W. by S. This ledge of rocks lies 1½ mile from the shore, extending about N. N. E. for near a mile, and close to this ledge you will have 4 and 5 fathoms, which deepens gradually as you run from it to the eastward: within one mile, you will have 10 and 12 fathoms.

In coming from the southward, bound into Plymouth, you must not open the northern light to the westward, but keep them in one, which will carry you in 5 fathoms by the easternmost part of Brown's Islands or shoal, keeping that course until you are within half a mile of Gurnet Head or nigher, where you will have but 4 fathoms; then Saquash Head will bear W. by N. a little northerly, and the two outermost trees on the head in one; then you may steer directly for them, until you bring the lights to bear E. N. E. and the house on Saquash Head to bear N. W. just open with the first Sandy beach, where you may anchor in 4 fathoms in Saquash Road, good clear bottom; but if you are bound for Plymouth or the Cow-yards, you must steer as before directed. If in the night, it is best to anchor here, as it is difficult to make Beach Point (as it is mostly covered at high water) if dark, or to go into the Cow-yard.

In turning into Plymouth, you must stand to the northward into not less than 3 fathoms, as it runs a flat a long way from the Gurnet Head to Saquash; and from both the heads lies off a point of rocks a good way from the shore, many of them but just under water at low ebbs. And all the way from Saquash to Muscle Bank, you have shoal water; so that you must not stand in less than before mentioned. And in standing over for the sands to the southward, you must go about as soon as you shoalen your water to 4 fathoms, as it is bold to, and you may observe the rips, unless it is very smooth. This sand extends from abreast of the lights to Beach Point, most of which is dry at low ebbs. From the easternmost part of this sand to Dick's Flat, it rounds with a considerable sweep; you have but 5 fathoms water from the easternmost part of Brown's Island to the Gurnet Head, and not more than 7 or 8 until you are abreast of Dick's Flat, where you will have 13 or 14 fathoms in a deep hole, and then shoalen to 5 fathoms abreast of Beach Point.

If you should fall in to the southward of Brown's Islands or shoal, between them and the Monument Land, where you have 20 fathoms in some places, you must not attempt to run for the lights, until you have them shut in one with the other, when they will bear N. N. W. ½ W.; if you do, you may depend on being on Brown's Islands or shoals, as there is no passage for even a boat at low water.

In coming in from the northward in the night, you must not bring the light to bear more southerly than S. by W. to avoid High Pine Ledge, and keep that course until you have them to bear N. W., or N. W. by W., when you will be clear of the rock, and may steer up W. by S. until you have lights to bear E. N. E., where you had best anchor in the night. Here the tide runs strong channel course from the Gurnet to the Race Point of Cape Cod; the course is E. ½ N. about 6 leaguest distant; and from the Gurnet to the point going into Cape Cod Harbor, is E. by S. 7 leagues.

If you should make the lights in hard northerly or N. W. winds, and cannot get into Plymouth, you may then run for Cape Cod Harbor, bringing the lights to bear W. by N., and steer directly for Race Point light, following the directions given for entering Provincetown Harbor, by the fixed light on Long Point, and come to anchor. If it should blow so hard that you cannot turn up the harbor, you may anchor off the point, clear bottom; you have 8 and 9 fathoms very nigh the shore, so that there is no danger of being on it, unless very dark.

At the Gurnet and Plymouth the tides are much the same as at Boston; that is, a S. E. moon makes full sea.

CAPE COD LIGHT.—A light-house containing a fixed light 200 feet above high water mark, is erected on the Clay Pounds, high lands of Cape Cod.

RACE POINT.—(Cape Cod.) On this point is a revolving light, 155 feet above the level of the sea. It cannot be seen by vessels inward bound, until it bears S. S. W. ¼ S.

LONG POINT.—On Long Point, at the entrance of Provincetown Harbor, is a light-house containing a fixed light, lying close to the point, and elevated 25 feet above the level of the sea.

CAPE COD HARBOR.—(Provincetown.) This is one of the best harbors on this coast. If bound into this harbor from the northward, you may run within half a mile of the light-house on Race Point; after passing it, and it bears east, steer S. S. E. 2¼ miles, when the light on the Highlands will bear E. by N.; then run for it 1½ mile, which will put you in the fairway of the harbor; then haul up N. N. W. westerly, a good mile, when you may anchor in 5 or 7 fathoms, with the light on Long Point bearing S. W. by S.

Ships of war should bring the light on Race Point to bear N. by W. and steer S by E. to pass Wood End Bar in 10 fathoms; as soon as the light on Long Point bears N. E.

by N., steer N. E. until in 8 fathoms water, when anchor, the light on the Highlands of Cape Cod bearing from E. ½ N. to E. ½ S.

Good anchorage may be found in a N. E. gale, by running for Race Point light, giving it one-third of a mile distance as you pass it, as soon as it bears E. N. E., when you will be safe with the wind from N. N. E. to S. E. by E.; haul up E. S. E. and anchor in from 10 to 4 fathoms.

Vessels inward bound, who fall in with the back of Cape Cod, may bring the light to bear S. W., 2 leagues distant, and then steer W. N. W., for Boston light-house, which contains a revolving light.

When up with Race Point, you will find it very bold about one mile to the westward of the light-house, and it may be known by a number of fish-houses on it. About one mile to the southward of Race Point is what is called Herring Cove, where you may have good anchorage half a mile from the shore, the wind from E. to N. N. E., in 4, or even in 3 fathoms water.

In passing Race Point to the southward, you must give it a berth of one mile, as there is a long flat of sand that lies to the southward of said point. You must not haul to the eastward till you come near Herring Cove.

In running from Race Point to Wood End, after you pass the Black Land or Hummocks, you will come up with a low sandy beach which forms the harbor, extending between two and three miles to Wood End, which is difficult to be distinguished in the night; it is very bold, and you will have 25 fathoms water within one-quarter of a mile of the shore.

In beating into Cape Cod Harbor, you must keep the eastern shore aboard until you get into 5 fathoms water. Stand no further to the westward than to bring the light to bear E. by S., as there is a long spit of sand runs off from the western shore, which being very bold, you will have 11 fathoms water within a stone's throw of the shore.

If it blows so hard that you cannot beat into the harbor, you will have good anchoring without, in from 10 to 15 fathoms water. Or if it blows hard at N. E., bring Race Point light to bear N. W. by N., and steer S. E. by S. 7 leagues, which course will carry you into Wellfleet. In steering this course, you will make Harwich right ahead: when you open the bay, you will bring Billingsgate Island light on your larboard hand, when you may haul to the eastward, and anchor safe from all winds.

BILLINGSGATE ISLAND LIGHT-HOUSE is on Billingsgate Island, at the entrance of Wellfleet Bay, five leagues S. E. by S. from Race Point light, and contains a fixed light. It is 40 feet above high water, and is situated so far up Barnstable Bay that it cannot be mistaken for any other.

Billingsgate Island is about 13 feet above the level of the sea at high water. It is high water in this bay, at the full and change of the moon, at 11 o'clock; the rise of the spring tides is from 12 to 14 feet; common tides from 9 to 11 feet. From the west end of Billingsgate Island extends a long shoal of hard sand 10 or 11 miles, in a W. by S. ½ S. to W. by N. from the light-house, and in a N. W. to N. N. W. direction, 5 or 6 miles; at the distance of 1½ to 2 miles from the light, are about 8 feet at low water, common tides; and the meeting-house with a steeple in Brewster, S. by E., at the distance of 5 miles from the light-house, 10 to 12 feet, the meeting-house bearing S. S. E., at the distance of 7 miles, 2½ fathoms of water, the meeting-house bearing S. E. by S.: at these depths of water the light-house bore from E. by N. to E. by N. ½ N. Crossing this shoal point of flats, you drop into 4 to 5 fathoms at the distance of 40 fathoms from the edge of this shoal, when the light-house will then bear E. N. E.

In coming around the shoal approach no nearer than 2½ fathoms. Soon as you deepen to 4 fathoms, haul up for the light and anchor.

Vessels drawing 12 feet of water, or upwards, should bring the light-house to bear E. N. E. to N. E. by E., and steer in E. by S. to E. S. E., until the light-house bears N. by W., when they will have good anchorage in 3 to 4 fathoms, low water, common tides, soft muddy bottom, and distance from the light-house 1½ to 1¾ mile; Brewster meeting-house on with a wind-mill that stands not far from it, when they will bear S. by W. ¾ W.; also the north meeting-house, that stands on a hill in Eastham, and no other building near to it, bore at the same time E. ½ N.

The following bearings and distances are taken from the light-house:—The high land of the north point of the Monument W. by N. ¾ N., distance about ten leagues; entrance of Barnstable, the Black Land, called by some Scargo Hill, in Dennis, S. W., distance 16 miles, S. W. ½ S. about 11 miles, Brewster meeting-house with a steeple to it, S. by W. to S., 9 miles; entrance of Orleans, S. E. ¾ S. 6 miles; Eastham north meeting-house S. E. by E. ¾ E. 4 miles; Silver Spring Harbor of Eastham, E. by N. ¾ N. four miles. The above places are all barred harbors, and flats extend off shore from one to two miles, with little water over them.

There is a rock in the passage way up to Wellfleet, that is about 12 feet long and 8 feet broad, called Bay Rock, on which there are one or two feet water at low tide, and round this rock are nine to eleven feet water at low tide, bearing from the light-house E. by S. ½

S., distance one and a quarter mile. When on this rock, Chipman's wind-mill, which is the south mill in Wellfleet, a little open to the north of a large rock called Blue Rock, by some, and stands near the shore of Wellfleet, when it will bear N. N. E. ¾ E. this rock is covered at high water; and a wind-mill on a hill in Eastham, over salt mills, which is near the shore at Eastham, these bearing E. by S. from Bay Rock. The east point of the Horse-shoe bears from the light-house E. N. E., distant about one-third of a mile. On the south side of Billingsgate Island, the flats extend off the distance of one half to three-quarters of a mile, having on them at low water, common tides, 6 to 9 feet water.

There is no meeting-house with a steeple to be seen to the eastward of Barnstable but the one in Brewster; and this meeting-house is a good mark to pass over the long shoal point, that extends off from the light-house.

From the light-house on the Race Point of Cape Cod, when bearing E. N. E., the course to Billingsgate point of flats is S. by E., distant 21 miles. Vessels drawing 12 feet water or upwards should steer from the Race light-house S., when distant from the Race one or two miles.

BARNSTABLE BAY.—From Centre Hill Point to Sausett Inlet is about 4 miles, bearing S. ½ E. This is a clean and bold shore, and may be approached at the distance of one-third to half a mile, carrying 3½ to 4 fathoms, sandy bottom. There is a bar of sand that lies parallel with the shore, near Centre Hill Point, extending to the southward, and terminating about three-quarters of a mile to the northward of Sausett. From the shore over this bar to 3 fathoms water, the distance is 240 to 250 fathoms, and the bar is from 100 to 140 fathoms wide, having on it from 9 to 11 feet water, and between that and the shore from 3 to 3½ fathoms. From the south end of this bar along shore to the entrance of Sandwich are 3 fathoms, and distance 70 to 90 fathoms, sandy bottom, and regular soundings as you approach the shore.

On the south side of Sausett Inlet is a low rocky point of 90 fathoms. Three-fourths of a mile off shore are 3 fathoms, and at the distance of 1½ or 2 miles are 9 to 10 fathoms, muddy bottom.

Passing from Sandwich towards Barnstable, the flats run off shore 100 to 180 fathoms.

The soundings are reduced to low water; the neap tides 8 feet; common tides 9 to 10 feet; spring tides 12 to 13. High water in the bay, at full and change of the moon, at 11 o'clock.

BARNSTABLE LIGHT is a fixed light erected on a dwelling-house, over which it is elevated 16 feet.

BARNSTABLE HARBOR.—When coming from the northward, the bar must not be approached in less than 5 fathoms water, until the light-house on Sandy Neck bears S. W. ½ W., which will bring you up with the buoy on the bar; haul close round it, leaving it on your starboard hand, run two cables' length S. S. W., then steer S. W. by W. ½ W. 1½ mile, which will bring you up with the tongue of Yarmouth Flats, or until the light bears S. W. by S., then steer for the light. Be careful to make the above course good, as the flood sets strong over Yarmouth Flats, and the ebb strong to the northward over the bar. Continue to run for the light until within the cable's length of the beach, and follow the shore round the point. There is safe anchorage inside, abreast of the light, against all winds, it bearing from S. W. to N. E., in 5 to 2½ fathoms water.

Vessels drawing 8 feet water may, at high water, bring the light to bear S. W. ½ W., and run directly for it. Full sea at full and change at 11 o'clock. Tide rises 10 feet, and there are 7 feet water on the bar at low water.

Description of the eastern coast of the county of Barnstable, from Cape Cod, or Race Point, in lat. 42° 5′ N., to Cape Malebarre, or the sandy point of Chatham, in lat. 41° 34′ N., pointing out the spots on which the trustees of the Humane Society have erected huts, and other places, where shipwrecked seamen may look for shelter.

The curvature of the shore, on the west side of Provincetown, and south of Race Point, is called Herring Cove, which is three miles in length. There is good anchoring ground here, and vessels may ride safely in four or five fathoms water, when the wind is from north-east to south-east.

On Race Point stand about a dozen fishing huts, containing fire-places and other conveniences. The distance from these huts to Provincetown, which lies on Cape Cod Harbor, is three miles. The passage is over a sandy beach, without grass or any other vegetable growing on it, to the woods, through which is a winding road to the town. It would be difficult, if not impossible, for a stranger to find his way thither in the dark; and the woods are so full of ponds and entangling swamps, that, if the road was missed, destruction would probably be the consequence of attempting to penetrate them in the night.

Not far from Race Point commences a ridge, which extends to the head of Stout's Creek. With the face to the east, on the left hand of the ridge, is the sandy shore; on the right is a narrow sandy valley; beyond which is naked sand, reaching to the hills

and woods of Provincetown. This ridge is well covered with beach grass, and appears to owe its existence to that vegetable.

Beach grass, during the spring and summer, grows about two feet and a half. If surrounded by naked beach, the storms of autumn and winter heap up the sands on all sides, and cause it to rise nearly to the top of the plant. In the ensuing spring the grass sprouts anew, is again covered with sand in the winter, and thus a hill or ridge continues to ascend as long as there is a sufficient base to support it, or until the circumscribing sand, being also covered with beach grass, will no longer yield to the force of the winds.

On this ridge, half way between Race Point and the head of Stout's Creek, &c., trustees of the Humane Society have erected a hut. It stands a mile from Peeked Hill, a landmark well known to seamen, and is about 2½ miles from Race Point. Seamen cast away on this part of the coast will find a shelter here, and in north-east storms, should they strike to the leeward of it, and be unable to turn their faces to the windward, by passing on to Race Point, they will soon come to the fishing huts before mentioned.

At the head of Stout's Creek the trustees have built a second hut. Stout's Creek is a small branch of East Harbor, in Truro. Many years ago there was a body of salt marsh on it, and it then deserved the name of a creek. But the marsh was long since destroyed; and the creek now scarcely exists, appearing only like a small depression in the sand, being entirely dry, and now principally covered with beach grass. The creek runs from north-west to south-east, and is nearly parallel with the shore on the ocean, from which it is at no great distance. Not far from it the hills of Provincetown terminate; and should not the hut be found, by walking round the head of the creek, with the face to the west, the hills on the right hand, and keeping close to the shore on the harbor, in less than an hour the shipwrecked seaman would come to Provincetown. It is high water at Truro about 30 minutes sooner than at Boston.

The Humane Society, several years ago, erected a hut at the head of Stout's Creek, but it was built in an improper manner, having a chimney in it, and was placed on a spot where no beach grass grew. The strong winds blew the sand from its foundation, and the weight of the chimney brought it to the ground, so that in January, 1802, it was entirely demolished. This event took place about six weeks before the Brutus was cast away. If it had remained, it is probable that the whole of the unfortunate crew of that ship would have been saved, as they gained the shore a few rods only from the spot where the hut had stood.

The hut now erected stands on a place covered with beach grass. To prevent any accident from happening to it, or to the other hut near Peeked Hill, the trustees have secured the attention of several gentlemen in the neighborhood. Dr. Thaddeus Brown, and Capt. Thomas Smalley, of Provincetown, have engaged to inspect both huts, to see that they are supplied with straw or hay in the autumn, that the doors and windows are kept shut, and that repairs are made when necessary. The Rev. Mr. Damon, of Truro, has also promised to visit the hut at Stout's Creek twice or thrice a year; and the Rev. Mr. Whitman, of Wellfleet, distinguished through the country for his activity and benevolence, has undertaken, though remote from the place, the same charge.

From the head of Stout's Creek to the termination of the salt marsh, which lies on both sides, and at the head of East Harbor River, the distance is about 3½ miles. A narrow beach separates this river from the ocean. It is not so regular a ridge as that before described, as there are on it one or two hills which the neighboring inhabitants call islands. It may without much difficulty be crossed every where except over these elevations. By these hills, even during the night, the beach may be distinguished from those hereafter to be mentioned. It lies from N. W. to S. E., and is in most parts covered with beach grass. The hills have a few shrubs on the declivities next the river. At the end of the marsh the beach subsides a little, and there is an easy passage into a valley, in which are situated two or three dwelling-houses. The first on the left hand, or south, is a few rods only from the ocean.

The shore which extends from this valley to Race Point, is unquestionably the part of the coast the most exposed to shipwrecks. A north-east storm, the most violent and fatal to seamen, as it is frequently accompanied with snow, blows directly on the land; a strong current sets along the shore; add to which, that ships, during the operation of such a storm, endeavor to work to the northward, that they may get into the bay. Should they be unable to weather Race Point, the wind drives them on shore, and a shipwreck is inevitable. Accordingly the strand is every where covered with the fragments of vessels. Huts, therefore, placed within a mile of each other, have been thought necessary by many judicious persons. To this opinion the trustees are disposed to pay due respect, and hereafter, if the funds of the society increase, new huts will be built here for the relief of the unfortunate.

From the valley above mentioned the land rises, and less than a mile from it the high land commences. On the first elevated spot (the Clay Pounds) stands the light-house, which contains a fixed light, which every navigator should impress on his mind. The shore here turns to the south, and the high land extends to the table land of Eastham.

This high land approaches the ocean with steep and lofty banks, which it is extremely difficult to climb, especially in a storm. In violent tempests, during very high tides, the sea breaks against the foot of them, rendering it then unsafe to walk on the strand, which lies between them and the ocean. Should the seaman succeed in his attempt to ascend them, he must forbear to penetrate into the country, as houses are generally so remote, that they would escape his research during the night: he must pass on to the valleys by which the banks are intersected. These valleys, which the inhabitants call hollows, run at right angles with the shore; and in the middle, or lowest part of them, a road leads from the dwelling-houses to the sea.

The first of these valleys is Dyer's Hollow, 1½ mile from the light-house. It is a wide opening, being 200 rods broad, from summit to summit. In it stands a dwelling-house, a quarter of a mile from the beach.

A mile and a half south of Dyer's Hollow is a second valley, called Harding's Hollow. At the entrance of this valley the sand has gathered, so that at present a little climbing is necessary. Passing over several fences, and taking heed not to enter the wood on the right hand, at the distance of three-quarters of a mile a house is to be found. This house stands on the south side of the road; and not far from it, on the south, is Pamet River, which runs from east to west through a body of salt marsh.

The third valley, half a mile south of Harding's Hollow, is head of Pamet Hollow. It may with ease be distinguished from the other hollows mentioned, as it is a wide opening, and leads immediately over a beach to the salt marsh at the head of Pamet River. In the midst of the hollow the sand has been raised by a brush fence, carried across it from north to south. This must be passed, and the shipwrecked mariner will soon come to a fence which separates what is called the road from the marsh. If he turns to the left hand, or south, at the distance of a quarter of a mile, he will discover a house. If he turns to the right hand, at the distance of half a mile, he will find the same house which is mentioned in the foregoing paragraph.

The fourth opening, three-quarters of a mile south of Head of Pamet, is Brushy Valley. This hollow is narrow, and climbing is necessary. Entering it, and inclining to the right, three-quarters of a mile will bring seamen to the house, which is situated at the head of Pamet. By proceeding straight forward, and passing over rising ground, another house may be discovered, but with more difficulty.

These three hollows, lying near together, serve to designate each other. Either of them may be used; but Head of Pamet Hollow is the safest.

South of Brush Valley, at the distance of 3 miles, there is a fifth opening, called Newcomb's Hollow, east of the head of Herring River, in Wellfleet. This valley is a quarter of a mile wide. On the north side of it, near the shore, stands a fishing hut.

Between the two last valleys the bank is very high and steep. From the edge of it, west, there is a strip of sand 100 yards in breadth. Then succeeds low brushwood, a quarter of a mile in width, and almost impassable. After which comes a thick, perplexing forest, in which not a house is to be discovered. Seamen, therefore, though the distance between these two valleys is great, must not attempt to enter the wood, as in a snow storm they would undoubtedly perish. This place, so formidable in description, will however lose somewhat of its terror, when it is observed, that no instance of a shipwreck on this part of the coast is recollected by the oldest inhabitants of Wellfleet.

Half a mile south of Newcomb's Hollow, is the sixth valley, called Pearce's Hollow. It is a small valley. A house stands at the distance of a little more than a quarter of a mile from the beach, W. by S.

The seventh valley is Cohoon's Hollow, half a mile south of Pearce's Hollow. It is not very wide. West from the entrance, several houses may be found at the distance of a mile. This hollow lies E. by N. from Wellfleet meeting-house.

Two miles south of Cohoon's Hollow, the eighth valley is Snow's Hollow. It is smaller than the last. West from the shore, at the distance of a quarter of a mile, is the county road, which goes round the head of Blackfish Creek. Passing through this valley to the fence, which separates the road from the upland and marsh at the head of the creek, a house will immediately be found by turning to the right hand, or north. There are houses also on the left, but more remote.

The high land gradually subsides here, and 1½ mile south terminates at the ninth valley, called Fresh Brook Hollow, in which a house is to be found a mile from the shore, west.

The tenth, 2½ miles south from Fresh Brook Hollow, is Plumb Valley, about 300 yards wide. West is a house, three-quarters of a mile distant. Between these two valleys is the table land. After this there is no hollow of importance to Cape Malebarre.

From Fresh Brook Hollow to the commencement of Nausett Beach, the bank next the ocean is about 60 feet high. There are houses scattered over the plain open country; but none of them are nearer than a mile to the shore. In a storm of wind and rain they might be discerned by daylight; but in a snow storm, which rages here with excessive fury, it would be almost impossible to discover them, either by night or by day.

NAUSETT BEACH LIGHTS.—On Nausett Beach three light-houses, one hundred and fifty feet apart, have been erected.

Not far from this shore, south, the trustees have erected a third hut, on Nausett Beach. Nausett Beach begins in latitude 41° 51′, and extends south to latitude 41° 41′. It is divided into two parts by a breach which the ocean has made through it. This breach is the mouth of Nausett, or Stage Harbor; and from the opening the breach extends north 2¼ miles, till it joins the main land. It is about a furlong wide, and forms Nausett Harbor, which is of little value, its entrance being obstructed by a bar. This northern part of the beach may be distinguished from the southern part by its being of a less regular form. Storms have made frequent irruptions through the ridge, on which beach grass grows. On an elevated part of the beach stands the hut, about 1½ mile north of the mouth of Nausett Harbor. Eastham meeting-house lies from it W. S. W., distant 1¾ mile. The meeting-house is without a steeple; but it may be distinguished from the dwelling-houses near it by its situation, which is between two small groves of locusts, one on the south, and one on the north, that on the south being three times as long as the other. About 1¼ mile from the hut, W. by N., appear the top and arms of a windmill. The Rev. Mr. Shaw, and Elisha Mayo, Esq., of Eastham, have engaged to inspect this building.

The southern part of Nausett Beach, most commonly called Chatham Beach, and by a few persons Potanumaqunt Beach, begins at the mouth of Nausett Harbor, and extends 8 or 9 miles south to the mouth of Chatham Harbor. It is about 50 rods wide. A regular well formed ridge, which, in the most elevated part of it, is 40 feet high, runs the whole length of it, and with the exception of a few spots, is covered with beach grass. This beach forms the barrier of Chatham Harbor, which, from Strong Island, north, receives the name of Pleasant Bay. A mile south of the entrance of Nausett Harbor, it joins the main land of Orleans, except in very high tides, when the sea flows from the north-eastern arm of Pleasant Bay into the harbor of Nausett, completely insulating the beach. By those who are acquainted with the shallow, it may be safely forded at any time; but strangers must not venture to pass it when covered with water, as below the channel is 7 feet deep. On this beach, about half way between the entrance of Nausett and Chatham Harbors, the trustees have erected a fourth hut. The spot selected is a narrow part of the beach: on the west, the water adjoining it is called Bass Hole. Salt Marsh is north and south of it, next the beach, but is here interrupted. Orleans meeting-house lies from it N. W. The meeting-house is without a steeple, and is not seen; but it is very near a wind-mill placed on an elevated ground, a conspicuous object to seamen coming on the coast. It may be necessary to add, that there are three wind-mills in Orleans, forming a semi-circle—that the mill referred to is on the right hand, or N. E. point—and that the mill in the middle point of the semi-circle stands on still higher ground. The meeting-house of Chatham is situated from it S. W. This meeting-house is also without a steeple, and is concealed by Great Hill, a noted land-mark. The hill appears with two summits, which are a quarter of a mile apart. The hut lies east from Sampson's Island, in Pleasant Bay. Timothy Bascom, of Orleans, has undertaken to inspect this hut.

Lest seamen should miss this hut, by striking to the leeward of it, the trustees have erected another on the same beach. It stands a mile north of the mouth of Chatham Harbor, east of the meeting-house, and opposite the town.

Another spot on the same beach would be a proper situation for a hut. It is north of the fourth hut, and east of the middle of Pochet Island. The highest part of the ridge is nearer it, south. A break in the ridge, over which the sea appears sometimes to have flowed, divides this high part from the northern portion of the beach.

On the beach of Cape Malebarre, or the sandy point of Chatham, the trustees have built a sixth hut. This beach stretches from Chatham 10 miles into the sea, towards Nantucket, and is from a quarter to three-quarters of a mile in breadth. It is continually gaining south: above three miles have been added to it during the past 50 years. On the east side of the beach is a curve in the shore, called Stewart's Bend, where vessels may anchor with safety, in 3 or 4 fathoms water, when the wind blows from north to S. W. North of the bend there are several bars and shoals. A little below the middle of the beach, on the west side, is Wreck Cove, which is navigable for boats only. The hut stands 200 yards from the ocean, S. E. from the entrance of Wreck Cove, half of a mile. Between the mouth of the cove and hut, is Stewart's Knoll, an elevated part of the beach. The distance of the hut from the commencement of the beach is 6 miles, and from its termination, 4 miles. Great Hill, in Chatham, bears N. by W., distant 6 miles; and the south end of Morris' Island, which is on the west side of the beach, N. by E., distant 4 miles. Richard Sears, Esq., of Chatham, has engaged to visit the two last mentioned huts. Two miles below the sixth hut is a fishing house, built of thatch, in the form of a wigwam. It stands on the west side of the beach, a quarter of a mile from the ocean. Annually, in September, it is renewed; and generally remains in tolerable preservation during the winter.

Another spot a few rods from the sea, 4 miles south from the commencement of the beach, and half a mile north of the head of Wreck Cove, would be a proper situation for a hut. A little south of this spot, in storms and very high tides, the sea breaks over from the ocean into Wreck Cove. Cape Malebarre Beach may be distinguished from the two beaches before described, not only by its greater breadth, but also by its being of a less regular form. It is not so well covered with grass as Chatham Beach. From Stewart's Knoll, south, to the extremity, it is lowest in the middle. In this valley, and in other low places, fresh water may be obtained by digging two feet into the sand. The same thing is true of Nausett and Chatham Beaches.

The six huts, the situation of which has thus been pointed out, are all of one size and shape. Each hut stands on piles, is 8 feet long, 8 feet wide, and 7 feet high: a sliding door is on the south, a sliding shutter on the west, and a pole, rising 15 feet above the top of the building, on the east. Within, it is supplied either with straw or hay, and is farther accommodated with a bench. The whole of the coast, from Cape Cod to Cape Malebarre, is sandy, and free from rocks. Along the shore, at the distance of half a mile, is a bar, which is called the Outer Bar; because there are smaller bars within it perpetually varying. This outer bar is separated into many parts by guzzles, or small channels. It extends to Chatham; and as it proceeds southward, gradually approaches the shore, and grows more shallow. Its general depth at high water is two fathoms, and three fathoms over the guzzles; and its least distance from the shore is about a furlong. Off the mouth of Chatham Harbor there are bars which reach three-quarters of a mile, and off the entrance of Nausett Harbor the bars extend half a mile. Large heavy ships strike on the outer bar, even at high water, and their fragments only reach the shore. But smaller vessels pass over it at full sea, and when they touch at low water, they beat over it as the tide rises, and soon come to land. If a vessel is cast away at low water, it ought to be left with as much expedition as possible; because the fury of the waves is then checked, in some measure, by the bar, and because the vessel is generally broken to pieces by the rising flood. But seamen shipwrecked at full sea, ought to remain on board till near low water, for the vessel does not then break to pieces, and by attempting to reach the land before the tide ebbs away, they are in great danger of being drowned. On this subject there is one opinion only among judicious mariners. It may be necessary, however, to remind them of a truth, of which they have full conviction, but which, amidst the agitation and terror of a storm, they too frequently forget.

CHATHAM LIGHTS are two fixed lights on James' Head, 70 feet above the level of the sea, they are only of use in running over the shoals, as the beach has made out 2 or 3 miles to the south since they were erected.

MONOMOY POINT LIGHT is a fixed light, 25 feet above the level of the sea, on Monomoy Point, the extreme southern point of the peninsula of Cape Cod; to the north the sea has made an inlet deep enough for small craft, making it an island.

CHATHAM HARBOR.—Chatham is situated on the exterior extreme of Cape Cod, bounded E. by the ocean, S. by Vineyard Sound, W. by Harwich, and N. by Pleasant Bay. Its harbor is convenient for the fishery, in which they have usually 40 vessels employed, and contains 20 feet at low water. This place is remarkable for many shipwrecks on its shores.

While passing Chatham in thick weather, approach no nearer than 5 fathoms to cross the Pollock Rip; edge off and on from 5 to 7 fathoms, which will carry you over the Pollock Rip in 3 fathoms.

SHOALS TO THE NORTHWARD AND THE EASTWARD OF NANTUCKET.

POLLOCK RIP.—This rip, on which there are but 5 feet water, extends E. ½ N., 6 miles from Monomoy Point light; on it, in 14 feet water, there is a red buoy, bearing from Monomoy light E. ½ N., 7 miles, and from the Little Round Shoal buoy N. E. by N., 4 miles.

LITTLE ROUND SHOAL.—This shoal, on which there are only 7 feet water, bears from Chatham lights S. by W., 4½ leagues; from Nantucket light N. E., 3 leagues; on it there is a white buoy in 14 feet water, with a small pole on the end of it.

GREAT ROUND SHOAL.—This shoal is partly dry at low water; it bears E. N. E., 8 miles from Nantucket light: on the northern part of the shoal there is a black buoy in 14 feet water. The white buoy of the Little Round Shoal bears from it N. W. by N., 2½ miles.

FISHING RIP.—This rip, on which there are from 5 to 7 fathoms water, is about 12 miles long from north to south, and very narrow; the northern point is 24 miles from Sancoty Head; there is a good channel of 12 to 22 fathoms, uneven bottom, 12 miles wide, between it and the Great Rip.

GREAT RIP.—This rip, on which there is shoal water, and is about 12 miles in extent from north to south, lies between the Fishing Rip and Sancoty Head: the northern end bears E. by N. ½ N., 11 miles, and the southern end E. S. E., southerly, 11 miles from Sancoty Head.

BASS RIP.—This rip, on which there are from 9 feet to 5 fathoms water, is about 9 miles in extent, from north to south, and narrow. The northern end bears from Sancoty Head N. E. by N., 3 miles distant; and the southern end, on which there are but 6 feet water, S. by E., 6 miles distant.

TIDES.—On the south shoal the flood tide sets north about 3 hours, then E. S. E., when the ebb commences at south, and continues till low water. At Sancoty Head, the flood sets N. E. and ebb S. W. In the middle (or E. N. E. channel) the flood sets N. E. by E., and ebb S. W. by W.

In Butler's Hole the ebb sets west, and flood east. From Chatham to Pollock Rip, the flood sets S. S. W. and ebb N. N. E.

From Butler's Hole to the Horse-shoe, ebb W. S. W.; then W. by N. to Holmes' Hole.

The depth of water on Nantucket Shoal and the Vineyard Sound, is taken at low tide. At Pollock Rip, Great Rip, Little Round Shoal, Point Rip and the Handkerchief, the tide rises and falls 5 to 6 feet. At the Horse-shoe, Cross Rip, Hedge Fence, Squash Meadow and Middle Ground, the tide rises and falls 3 to 4 feet. S. ½ E. moon makes full sea in the sound.

CHATHAM TO HOLMES' HOLE.—Bring Chatham lights to bear N. N. W., then, by steering S. S. E., 3½ leagues, you will pass the Pollock Rip, in 3 or 4 fathoms water; and if the weather is clear you will make the light-house on Sandy Point, (Nantucket Island,) 5½ leagues distant, which bring to bear S. W. ½ W.; then steer for the light-house, keeping it in this direction, and you will pass between the Great and Little Round Shoals, on the former of which is a black buoy, and on the latter a white buoy, with a small pole in the end of it, bearing N. W. by N. and S. E. by S. from each other, distant 2½ miles.

When you are within about 3 miles of the light-house, steer W. ½ S. until you are past the Point Rip, on the N. E. end of which is a red buoy in 14 feet water, bearing from Sancoty Head N. by W., 4 leagues; from Nantucket light N. E. by E. ½ E., 2 miles, and from the black buoy on the Horse-shoe E. S. E., 6 leagues. Shoalest water on Point Rip, 8 feet: or you may bring the light-house to bear E. by S. ½ S., and steer W. by N. ½ N., taking care to make your course good for Holmes' Hole light, 11 leagues distant, observing, while running from Nantucket light to Holmes' Hole, you leave on your larboard hand Cape Poge light, which must bear W. ¾ S., to clear the Cross Rip, on the N. E. part of which is a white buoy, in 15 feet water, bearing from Cape Poge light E. by S., 5 leagues; from Tuckanuck Island N. by W., 2 leagues, and from the red buoy on Squash Meadow E. by S. ¾ S. 5 leagues. Shoalest water on this rip, 12 feet.

To go through the North Ship channel, bring Chatham lights to bear N. N. W. and steer S. S. E. 3½ leagues, when you will pass the Pollock Rip in 3 or 4 fathoms water, when you must steer W. ½ S. 5 miles for Butler's Hole, in 15 fathoms water, when you will see a white buoy to the north of you, which lies in the S. S. W. passage, when you must run W. S. W. for the south part of the Handkerchief, which has a white buoy on the west end of it, bearing from Monomoy Point light S. W. 2 miles, when you will be in 3 fathoms water, fine sand; from Nantucket light N. by E. ½ E. 4 leagues, and from the red buoy on Pollock Rip W. by S. ½ S. 3 leagues.

Crossing the Handkerchief, on a W. S. W. course, in 3 or 4 fathoms water, you will run W. for the black buoy on the Horse-shoe, 11½ miles, leaving it on the starboard hand, when you will continue your course W. for Holmes' Hole light, 4½ leagues distant.—As you enter the Swash, in the Horse-shoe, Hyannes light will bear N. N. E., Cape Poge light W. S. W., Holmes' Hole light W. Part of the Handkerchief dry at low water.

There is a channel of 9 feet, still north of the above, which may be found by bringing Chatham lights to bear N. W. when in 7 fathoms, and running S. S. W. for Sandy Point of Monomoy light, till the light bears S. W., then run for it till you cross from 3 to 7 fathoms, when you will be within 3 cables' length of the light, where you may anchor and continue till 2½ hours flood, when, if bound to the westward, continue the shore on board round the point, crossing a spit between Egg Island and Monomoy Point, in 2 fathoms; then steer N. W. till the light bears E, when you must run W. N. W. for Hyannes light, or haul into Stage Harbor Bay and anchor.

HOLMES' HOLE is a harbor to which vessels resort during the winter season, and as every master should embrace the first opportunity to advise his owner, we state there is a Post Office and a regular mail made up twice a week for Boston, &c., which is taken in a passage boat to Falmouth, on the N. E. part of Vineyard Sound, 9 miles distant; from thence by land carriage to Sandwich, &c. Passengers will find a speedy conveyance from Falmouth. A light-house, showing a fixed light, is erected on the West Chop of Holmes' Hole, on the starboard hand as you enter the harbor. Four miles west of Falmouth is Nobsque Point, on which a light-house is erected, showing a fixed light, elevated 80 feet above the sea. It is intended to guide vessels passing over the shoals, through the north channel into the Vineyard Sound. The following bearings have been taken:—West Chop light-house, S. E. ½ S., distant 4 miles; east end of Middle Ground, S. E. ¾ S., 3½; west end of do. S. W. by S., 4; Gay Head light-house, S. W. ½ W., 15; Tarpaulin

Cove light-house, W. S. W., 6; Falmouth Wharf, N. E. by E., 3; Sucannu Set Point, E. ¾ N., 7; S. W. part of the Hedge Fence, E. S. E., 4; Cape Poge light-house, S. E. ½ E., 14; east Chop Holmes' Hole, S. E., 6. By keeping the Nobsque light open by the east Chop of Holmes' Hole, will clear the Old Town Flats.

OLD STAGE HARBOR.—If you intend, when passing Monomoy Point, to make a harbor, when about 100 yards west from the point, steer N. N. W. from 5 to 6 miles, to avoid the common flat which makes off from the beach, then steer E. N. E. two miles, which will bring you to anchorage, in from 3 to 5 fathoms, good holding ground. This harbor is exposed to winds from South to West by North.

Monomoy Point bears from the anchorage south, distant about 8 miles.

To go through the S. S. W. channel, get Monomoy Point light to bear N. by E. ½ E., and run S. S. W. 1½ mile, into Butler's Hole, in 7 fathoms, and a S. S. W. course continued will carry you to the westward of Nantucket Point light, 5 leagues. In the S. S. W. channel, are 2 fathoms at full tide.

Bring Chatham lights to bear N. by W., on which bearing keep them till you cross the Pollock Rip in 3 fathoms water, and deepen into 7 fathoms; then steer S. W. by S., which carries you across Butler's Hole to 5 or 4 fathoms; then steer W. S. W., which will carry you to the northward of the Little Round Shoal up to Tuckanuck Channel, when you will be up with the S. E. end of the Horse-shoe, where you have 9 fathoms, then steer W. by N. for Cape Poge Light. From the Stone-horse, to the S. E. end of the Horse-shoe, the distance is 5 or 6 leagues. To go through the Moskeekett Channel, bring the light on Cape Poge to bear N. by W., and steer S. by E., which will carry you to the eastward of Skiff's Island, which you may go within half a mile of.

To go through the Swash of the Horse-shoe, bound to the westward, after passing the Stone-horse, and you deepen your water to 6 fathoms, steer W. till you bring Cape Poge light to bear W. S. W.; then steer directly for it through the Swash of the Horse-shoe, till you deepen twelve fathoms; then steer for the east Chop of Holmes' Hole.

To go to the northward of the Horse-shoe, bring Point Gammon light to bear E. N. E.; Seconset Point to bear W. N. W.; when you will see the northernmost dry shoal of the Horse-shoe. Bring Cape Poge light to bear S. S. W., and run for it. In beating to windward, come no nearer the north shore than 3 fathoms; when past the dry spot of the Horse-shoe, steer S. W. by S. till you bring the east Chop to bear W.

HYANNES LIGHT is situated on Point Gammon, at the entrance of the harbor, south side of Cape Cod. The lantern is elevated 70 feet above the level of the sea, and contains a fixed light.

East from Hyannes lies Bass River, near which are the towns of Dennis and Yarmouth, between which a large pier has been erected, which has washed away. A buoy is placed on Dogfish Bar. A beacon, (or rather a large stick,) on the top of which is a small cask, is also stuck up on the Bishop and Clerks.

POINT GAMMON LIGHT AND HYANNES HARBOR.—Vessels coming from the eastward, bound through the North Channel, must leave the Bishop and Clerks on the larboard hand, and not go nearer them than 4 fathoms. They are a dangerous ledge of rocks, bearing S. by E. from the light-house, 3 miles distant, and are always dry. When the light bears N. by W. steer W. N. W., keeping in 4 fathoms, till the light bears N. N. E.; then steer N. W., or N. W. by N., keeping in 3 fathoms, which will keep you clear of a dangerous reef running from the light to a great rock which you leave on your starboard hand; when abreast of this rock, the light will bear S. E. ½ E.; then steer N. N. W., and anchor within one mile of the shore, in 3 fathoms, soft bottom. The brig Monroe, Capt. Bears, in coming through the Vineyard Sound, struck on a dangerous rock, which is in the direct track in passing the North Channel, and bears about W. S. W. from Point Gammon light-house, distant two or three miles. It is a large square rock, and it is supposed there are on it about three feet of water at low water. Several vessels have struck on it at different times, and it is extremely important to the safety of people and property, that it should have a buoy on it. Vessels should not come nearer than three-quarters of a mile of the light, as there are sunken rocks that lie one half a mile from the land.

Vessels bound to the westward from Hyannes, must run to the southward till the light bears E. by N.; then steer W. by S., which course will carry them clear of the southwest rock, which bears west from the light, 4 miles distant, with several sunken rocks near it; said rock is dry at low water. W. ½ S., 8 miles distant from the light, is a dangerous ledge, called Culler's Ledge, 3 miles from the shore. There are 3 fathoms water round it, and the ledge is part dry at low water. In running this W. by S. course, (the light bearing E. by N.,) you will have from 3 to 4 fathoms, and sometimes 5, as it is ridgy. If farther towards the Horse-shoe, to the southward, you will have 4, 5, 6, 7, 10, and close to the Horse-shoe, 13 fathoms: northern part of the Horse-shoe dry at low water. On the S. E. part of the Horse-shoe is a black buoy placed, in 16 feet water, bearing from Nantucket light N. W. by W., 4½ leagues, and from Tuckanuck Island, N. by E., ½ E., 5 leagues. Tide rises about 5 feet; high water, at full and change, at 12 o'clock; and

runs from 2 to 3 knots east and west in the following manner, viz: it begins to run to the westward at half flood, and continues to half ebb, then runs to the eastward, the three last hours of ebb, and three first of flood.

A floating light has been anchored on the eastern extremity of Tuckanuck Shoal, (which lies between Cape Poge and Tuckanuck Island,) and the following bearings taken from the vessel:

Point Gammon light-house bears N.; Chatham light, N. E.; Sandy Point light, N. E. by E.; Nantucket Great Point light, E. S. E.; Nantucket Brant Point light, E. S. E. ¼ E.; Nantucket Beacon light, S. S. E.; Cape Poge light, W. by N.; centre of Tuckanuck Island, S. S. W. ½ W., distant 7 miles.

In proceeding from the Horse-shoe towards Holmes' Hole, observe the following directions, viz: When to the northward of the Horse-shoe, in 12 fathoms water, one mile distant from the dry spots, at low water, steer S. W. for Holmes' Hole, 3½ leagues distant. If bound to the northward of the Hedge Fence, (between that and Lemedue Shoal,) get the point on which the wind-mill stands, (which is east of Wood's Hole,) to bear W. by N., and run for it till within half a mile; then W. S. W. will carry you through the Vineyard Sound, leaving Tarpaulin Cove and Cutterhunk lights on your starboard hand, and Gay Head light on your larboard hand. You will not see Cutterhunk light till 4 leagues to the westward of Tarpaulin Cove light, when it will open on the starboard hand; when it bears N. E. by E., distant 3½ miles, you may run west for Point Judith light, (if bound up the sound,) 10 leagues distant.

Near the north end of Cross Rip, a floating light is moored in 7 fathoms water; 200 fathoms south of the light are 11 feet water. Bring Nantucket light to bear E. S. E., and run W. N. W., will carry a vessel to the Light Boat, and thence to Holmes' Hole.

Bearings and distances from the Nantucket Light Boat,

Nantucket Great Point Light	E. S. E.	14	miles.
N. E. end Tuckanuck Shoal	S. E. ½ E.	4	do.
Tuckanuck Island	S. ½ E.	8	do.
Cape Poge Light	W. ½ S.	10	do.
East Chop Holmes' Hole	W. by N. ¼ N.	16	do.
Point Gammon Light	N. ½ E.	12	do.
Main body of Horse-shoe	N.	1¼	do.

NANTUCKET LIGHT is on the N. E. point of Nantucket Island; is a fixed light, and is elevated 70 feet above the level of the sea.

Nantucket Harbor light-house is on the south side of the harbor, on high ground, some distance from the shore, is a small pyramidical building, and contains a fixed light. Its only use is to assist vessels entering the harbor, to pass the bar.

NANTUCKET HARBOR.—If the light-house on the south side of the harbor cannot be seen, bring the light on Brant Point, (which lies on the starboard hand and shows a fixed light) to bear S. by E. (none to the south of that) and run for it till within about a cable's length; then run to the eastward for the end of the point, and pass it as near as you please.

Nantucket Bar.—It is understood that a new channel over this dangerous shoal has been explored and buoyed out, by some of our enterprising master mariners and pilots; and that the keeper of the light-house on the south side of the harbor, having been waited upon by them, and several of the principal merchants and ship owners, has caused the removal of the light-house under his care to a point designated. As this new channel is declared by the pilots to be considerably deeper than that formerly used, and has the advantage of being straight and easy of access, the public good is greatly subserved by an alteration which will facilitate its use; and which has been made, we understand, without any additional expense to the United States.

Directions for ships bound over the Shoals of Nantucket, from the Bar.—From Nantucket Bar, the course is about N. N. E. to the Great Point; if a west tide, run for the light-house, pass the Great Point, keeping it about two miles distant from you; an east tide may set you on the Point Rip. Keep the town open, clear of Great Point, until you are three miles to the N. N. E. of the point; then run S. E., keeping three miles from the land, until the light is west from you; then running east, keeping the light-house bearing west, will carry you to sea. When you are in 25 fathoms, you are without the Great Rip. If a light wind, and a southerly tide, there is danger of being set by the tide too near the rip; therefore it is best, after being sure that you are without the Round Shoal, to run E. by N., or E. N. E., according to the wind and tide. When you have passed the Round Shoal, there is nothing to fear, from N. to E. until you come to the State of Maine, on the one hand, or the shoal of George's on the other. The above is the Old Channel-way.

After you are three miles N. N. E. from the Great Point light, run S. E., keeping three miles from the land, until Sancoty Head bears S. W.; you may then run N. E.

which will carry you channel-way. The Round Shoal bears from the Great Point light E. N. E., eight miles off.

When you are three miles to the N. N. E. of the Great Point light, with the town open clear of the Point, run S. E., keeping three miles from the land, until the town is over the middle of the head of the harbor; keeping it so, will carry you out channel-way.

When the town is shut in by the high land of Pocomo or Squam, you are in danger of the north end of the Bass Rip, also the north end of the Great Rip.

The tide turns at the foot of the shoals, three hours before it is high water at the bar. Abreast of the Great Rip, the ebb tide sets to the S. S. W. and the flood to the N. N. E.; therefore it is necessary, in light winds, to be careful that you do not get set by the tides on the Rip.

The Fishing Rip bears about E. S. E. from the Great Rip, from five to seven leagues distant. From the Great Point light to the Great Rip, is E. by S. ½ S., 5 leagues distant; the Fishing Rip is from 10 to 11 leagues distant from the Great Point light; between those two rips the bottom is uneven, having from 12 to 22 fathoms. The Two Rips lay nearly north and south, and are about twelve miles in length.

At the full and change of the moon, it is full sea at Nantucket at about twelve o'clock, noon.

Courses and distances from Nantucket Light-house.

		Courses.	Leagues.
From Light-house	to the Handkerchief	N. by E.	4½
do.	to the Snow Drift	N. N. E.	5
do.	to the Stone Horse	N. N. E. ½ E.	3½
do.	to the sandy point of Monomoy	N. by E. ½ E.	5½
do.	to the Little Round Shoal	N. E.	3¼
do.	to the Pollock Rip Buoy	N. E. ½ N.	5
do.	to the Great Round Shoal	E. N. E.	2⅔
do.	to the north end of Great Rip	E. by S. ½ S.	5
do.	to Nantucket Harbor	S. S. W.	2⅔
do.	to Tuckanuck Shoal	W.	3
do.	to East Chop of Holmes' Hole	W. by N.	9
do.	to Horse-shoe	N. W. by W.	4½
do.	to Hyannes	N. W. ½ N.	7
do.	to the west part of George's Bank	E. ½ N.	32
From the east end of Nantucket (called Sancoty Head) to the South Shoal		S. by E.	4

Variation 6° 30′ W.

Directions for entering Nantucket Harbor.—Bring the south light and the light on Brant Point in one, at the outer buoy; and the south light should be opened to the westward on this range, one handspike's length, to run the channel from the bar or outer buoy, to the shoaling of the water on Brant Point.

From Brant Point N. N. W. ½ W. 300 fathoms; then N. by W. ½ W. 100 fathoms; then N. 350 fathoms over the bar,

From the bar N. by W. ¾ W. eight and one half miles will cross Tuckanuck Shoal in 17 or 18 feet water.

CAPE POGE LIGHT is on the N. E. point of Martha's Vineyard; is a fixed light, and 55 feet above the level of the sea.

* EDGARTOWN HARBOR lies between Martha's Vineyard and Cape Poge. Vessels bound eastward, and wishing to enter Edgartown Harbor, from the east end of Squash Meadow Shoal, in 3 fathoms water, bring the harbor light to bear S. and Cape Poge light to bear S. E.; then steer S. S. E.; they will pass the Long Flat in 4 fathoms of water, until the harbor light bears S. W. by S.; then steer S. S. W.; they will have 6 and 6½ fathoms water, until the harbor light bears W.; then steer W. by S., and pass the light about a cable's length to the right hand, which courses will carry them up to the wharves.

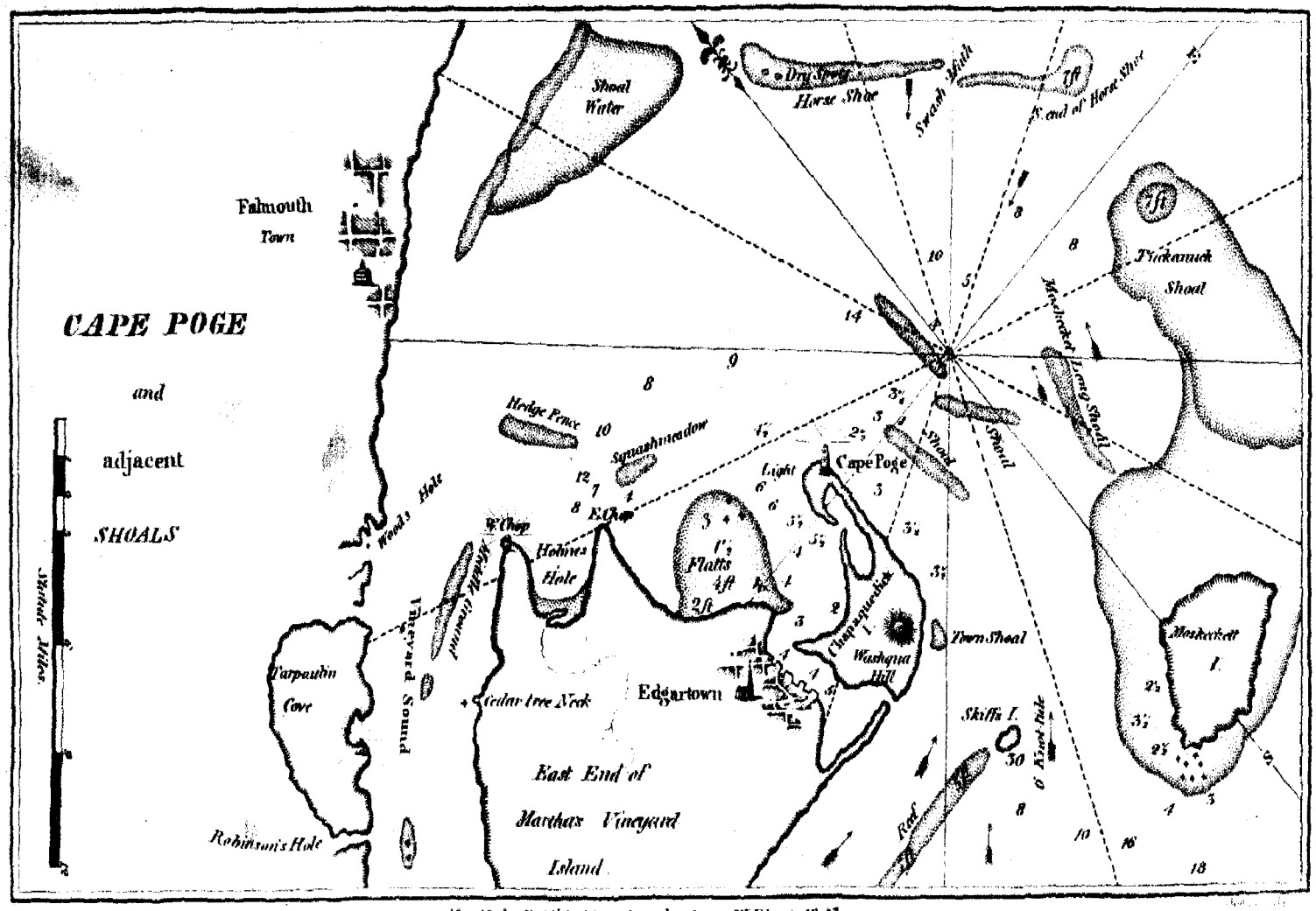
Vessels bound westward, and wishing to enter Edgartown Harbor, after passing near Cape Poge, in 4 or 5 fathoms water, bring the harbor light to bear S. W. by S., and steer S. S. W., until the harbor light bears W., then steer W. by S., and pass the light about a cable's length to the right hand, which courses will carry them up to the wharves.

If vessels wish to anchor in the outer harbor, they will follow the above directions until the harbor light bears W. by S., and Cape Poge light bears N. E. ½ E., when they may anchor in 4½ or 5 fathoms water, and very good holding ground.

In leaving Holmes' Hole to pass over the shoals, keep the West Chop open to the northward of the East Chop, until you have passed Squash Meadow Shoal, on the N.

* A fixed light is erected at the entrance of Edgartown Harbor, on a pier running from the west side, 1000 feet from the beach. It is elevated 50 feet above the level of the sea.

Engraved for the American Coast Pilot, 14th Ed.



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W. end of which is a red buoy, with a small pole in the end of it, placed in 16 feet water, bearing from Cape Poge light N. W. ½ W., 6 miles; from West Chop light, S. E. by E. ¼ E., 6 miles; and from the black buoy, or Hedge Fence, S. by E., 2 miles. Shoalest water 5 feet. The buoy lies about 2½ miles from the East Chop, must be left on the starboard hand, when your course will be E. by S., in 10 or 12 fathoms water, which course you must continue till you pass Cape Poge light. If it should be tide of flood, you must steer E. by S. ½ S., as the tide of flood sets very strong to the northward, between Cape Poge and Tuckanuck Island, and the tide of ebb to the southward, so that you must govern your course by the tide. In clear weather you may see Nantucket light-house 18 miles, which you must bring to bear E. by S. ½ S., which course you are to steer, passing it at the distance of one league, when you must bring it to bear west, and steer east, taking care to make this course good, which will carry you over the shoals in ship channel; the ground is very uneven, and you will have from 4 to 8 fathoms water. When you have passed over the shoals, you will have from 10 to 14 fathoms water, and then by steering north, you will make Cape Cod light-house, (which contains a fixed light,) distant 18 leagues.

To go to the northward of the Great Round Shoal, on the northerly part of which is a black buoy, which you leave on your starboard hand, placed in 14 feet water, bearing from Sancoty Head, N. by E. ½ E., 5 leagues; from Nantucket light, E. N. E. ½ N., 10 miles, and from the red buoy on Point Rip, E. N. E., 3 leagues; shoalest water 5 feet; you must proceed according to the foregoing directions, until you pass the light-house, and bring it to bear S. W. ½ W., then, by making a N. E. ½ E. course good, you will go between the Great and Little Round Shoals, on the south part of which is a white buoy, with a small pole in the end of it, placed in 14 feet water, bearing from Chatham lights S. by W., 4½ leagues; from Nantucket light, N. E., 3 leagues; and from the black buoy on the Great Round Shoal, N. W. by N., 2½ miles; shoalest water 7 feet, in 2½, 3, 4, and 5 fathoms water, until you have crossed the Pollock Rip, where you will have about 3 or 4 fathoms water, on which is a red buoy, which you leave on your larboard hand. The Little Round Shoal bears N. W. from the Great one, distant about 2½ miles. Continue your N. E. ½ E. course, until you deepen your water to 12 or 13 fathoms, and then steer north for Cape Cod light-house, before mentioned.

Bearings and distances from the light on Cape Poge, and depth of water of several most dangerous shoals in sight of Cape Poge light-house, and the bearings of the East Chop of Holmes' Hole.

East Chop,	N. W. by W. ¼ W. from said light,				7½	miles distant.
Squash Meadow Shoal,	N. W. ¾ W.,	5	feet at low water,		5½	do.
Norton's Shoal,	E. ⅛ S.,	9	do.	do.	7½	do.
Moskeeket Long Shoal,	E. ¼ S.,	6	do.	do.	8	do.
Tuckanuck Shoal,	E. ¾ S.,	7	do.	do.	14	do.
South-end Horse-shoe,	E. ½ N.,	7	do.	do.	13½	do.
Dry Spots Horse-shoe,	N. E. ½ N.,	dry			10	do.
Swash of Horse-shoe,	E. N. E.,	12	do.	do.	9	do.
Tuckanuck Shoal from Nantucket light,	W. by N.,	7	do.			
Horse-shoe from do.	N. W. by W.					
Coast from Nantucket light, bound westward,	W. by N. ½ N.					
From Cape Poge to Skiff's Island,	S. ¼ W.,	dry			9	do.
Hawse's Shoal, the shoalest part,	S. E. ½ E.,	6	do.	do.	3½	do.

NANTUCKET* SOUTH SHOAL, &c.

THIS dangerous shoal, which lies in lat. 41° 04′ N., long. 69° 56′ W., bears S. by E. from Sancoty Head, 4 leagues distant. It is composed of hard white sand, over which the sea breaks in the most tremendous manner, having on it, in many parts, only 3 feet water, and the tide meeting it obliquely, passes over it in different directions. The course of the tide is N. E. and S. W., beginning to run S. W. at 10 o'clock on the day of full moon, and continues in that direction about 7 hours. It extends from east to west one mile, and is in breadth two cables' length. It often breaks in 5 fathoms, on the east and west of the shoal. The rip which extends from the western end, has about 7 fathoms water on it.

*This shoal, together with George's Bank, have been surveyed at the expense of E. M. Blunt, and published on a large scale, by E. & G. W. BLUNT, 179 Water, street corner of Burling Slip.

South from the South Shoal, half a mile distant, the bottom is uneven, from 3 to 5 fathoms. There is a rip puts off from the west end of the shoal to the south and west, and sweeps round so that the south end of the rip bears nearly south from the shoal, on which it sometimes breaks in 7 or 8 fathoms water, at the distance of 5 miles from the shoal: between the outer part of the rip and the shoal is uneven bottom and full of rips.

The tides run round the compass in 12½ hours, but the southern tide has the greatest duration, and runs the strongest.

All who pass near the South Shoal should, for their own safety, pay particular attention to the tides, sometimes a current sweeping them over the bottom with a velocity as great, and even much greater in some instances, than the vessel moves through the water.

Extract from the surveying sloop Orbit's Journal.

"Sancoty Head bearing Siasconset town Southernmost land	N. W. N. W. ½ N. W.	Came to a large swash through the Bass Rip with 5 fathoms. Standing on the rip, had from 9 feet to 2 fathoms, hard sand.
"Sancoty Head bearing Siasconset Tom Never's Head Southernmost land	N. by W. N. N. W. N. W. by N. W. N. W.	On the south breaker of Bass Rip, in 9 and 8 feet, and less.

"Kept standing on to the southward in a channel of from 6, 7, and 8 fathoms, Sancoty Head bearing N. by W., 8 miles, crossed a dangerous rip in 2½ fathoms, lying S. W. by S. From this rip, E. S. E., 3 miles distant, is another rip, between which are 9, 15, 17, 14, 6, and 4 fathoms, which is the shoalest water on the rip: then standing east, had 7 and 8 fathoms; three cables' length from this rip, came to another with 4 fathoms water; from this, at equal distance, came to a third, then a fourth, all of which were within the limits of 3 miles, and lay N. and S. Although they have the appearance of danger, there are not less than 4 fathoms on the shoalest part. After crossing the fourth rip, came into deep water within one mile, viz: 12, 17, 22, and 25 fathoms, sand and red gravel. When over, had smooth water with 3 fathoms, and made a south course, having 4, 11, 18, and then 11 fathoms, and crossed the east end of the South Shoal in 2 fathoms, running down the south side in 13 fathoms, 80 fathoms distant, when we anchored in 10 fathoms. Got under way and stood to the westward; had 7, 4, 6, 5, and 7 fathoms; doubled round the west end in 3 fathoms, fine sand; when over, had 7 fathoms, the tide setting N. N. W. Kept along the north side in 2½, 2¾, and 2 fathoms, one cable's length from the breakers. When about midway the shoal, perceived a swash, through which we crossed between the breakers, in a S. S. E. direction, had 2½ and 2 fathoms, and one cast 9 feet, at which time it was about half tide. In a few moments, deepened to 4, 5, 6, and 7 fathoms, 2 cables' length from the shoal, hard white sand. From this, steered S. ½ W., to make a south course good, kept the lead going, and increased the soundings gradually to 10 fathoms, fine black and white sand, then one mile from the shoal. From this sounded every three miles, depth increasing about one fathom per mile, till at the distance of 7 leagues from the south shoal, where we found 28 fathoms, fine black and white sand. This was in lat. 40° 42′ N. long. 69° 56′ W. The same quality of soundings continue till you get in lat. 40° 31′ N., when you will have 40 fathoms, soft mud, from which it continues muddy bottom till off soundings, and in 40° 00′ N. no bottom, with 120 fathoms."

NOTE.—The Orbit, (Capt. J. Colesworthy,) was sent by the author of this work to ascertain the exact situation of the South Shoal, which differing so much in latitude from what it had ever been laid down, induced several gentlemen in Nantucket again to engage in the enterprise, who confirm the surveys made in that vessel, and make the following report: "Observed in lat. 41° 4′ 11″ N., abreast of the shoal, as laid down by Capt. Colesworthy; steered off S. by W., 22 miles, and regularly deepened the water to 35 fathoms; steered E. N. E., twelve miles, to 30 fathoms; N. W., twenty miles, to 18 fathoms; S. S. W., ten miles, to 30 fathoms; and N. N. W., fourteen miles, regularly shoaling until 6 A. M., made the mills, and came in at one P. M. These several courses formed a track over where Paul Pinkham has laid the South Shoal of Nantucket, and on which there are 28 fathoms."

Seven leagues to the westward of the South Shoal, in 25 or 30 fathoms, you will have black mud of a shining smooth nature, when you will be in Tuckanuck Channel.

To the westward of the South Shoal of Nantucket, you have no shoals, rips, nor tides to hurt you, until you come near the land; but clear sea, good navigation, and regular soundings. To the eastward and northward of the South Shoal, you will have a rapid tide.

POCHICK RIP lies off the South-east part of Nantucket Island. It commences a few rods south of Siasconset town, and then runs E. S. E., one mile, when you come to a corner on which are 6 feet at low water; between this corner and the island

there are a few swashes, from 2½ to 3 fathoms, through which vessels may pass. From the corner the rip runs south, 1½ mile, when you come to another swash, half a mile wide, with 7 fathoms: W. S. W., one-quarter of a mile from this channel, is a very shoal spot, with 6 feet, which runs S. W. by W., one-quarter of a mile, when you fall into a swash 40 rods wide, Tom Never's Head bearing N. N. W., 3 miles distant. You then come to the east end of the Old Man, which runs W. S. W., about 4 miles, on which are from 9 feet to 3 fathoms; when over the Old Man, you will drop into 7 fathoms, fine sand, with black specks.

Between the Old Man, Tom Never's Head, and Pochick Rip, there is a very good roadstead, or anchorage; and with the wind at N. W., N. N. E., E. S. E., and far as south or S. S. W., preferable to any harbor in the Vineyard Sound for vessels bound to the northward or eastward, particularly in the winter season, provided your cable and anchors are good. Tom Never's Head bearing E. N. E. ½ N., the southernmost land W. by N., you will have 5 fathoms, coarse sand; from which, to the Old Man, you will have 5, 6, 6½, 7, 8, 9, 10 to 14 fathoms, red sand, then half way between the two; from this you shoalen to 13, 11, 8, 7, 5, 4, and 3 fathoms, fine sand, with black specks.

The Great Rip is about 4 leagues from Sancoty Head; on this rip, about E. S. E. from Sancoty Head, there are 4 feet water; and east from Squam there are 5, but on many other parts of it there are 2½, 3, and 4 fathoms water.

Fishing Rip is about 8 leagues from Sancoty Head, and has from 5 to 7 fathoms water on it. Between this and the Great Rip, the ground is uneven; there are 12, 22, and 15 fathoms water. These two rips stretch nearly north and south, and are about 12 miles in length. Off the east part of Nantucket Island, lies the Bass Rip, about 3 miles from Sancoty Head.

Around the coast of Nantucket and the shoals, you will have sandy bottom, and in moderate weather had better anchor than be driven about by the tide, which is very rapid. The course of the tides at and over Nantucket Shoals, is nearly N. E. and S. W., and regular. The N. E. tide makes flood. S. S. E. moon makes high water. South moon makes full sea at Nantucket Harbor.

S. S. E. and W. N. W. moon makes high water on the shoals; the tide of flood sets N. E. by E., and ebbs S. W. by W., from 2 to 3 knots an hour. It ebbs and flows about 5 or 6 feet.

BLOCK ISLAND CHANNEL, &c.—*Directions for those running for Block Island Channel, to the southward of Martha's Vineyard, Vineyard Sound, Nantucket Island, and such as are bound into the Vineyard Sound, and intend going over the shoals to the eastward.*

In approaching the south end of Block Island (on the N. W. point of which two light-houses are erected, as after described) from the southward, the water shoals gradually. When the island bears from N. W. to N. by W., the bottom is mud: this is commonly called Block Island Channel. This island, if you come from the southward, appears round and high; and if you approach it from the S. E., it appears like a saddle, being high at both ends, but highest to the southward. Your course from the S. E. head of Block Island to *Gay Head light-house is E. by N., 15 leagues. The current in Block Island Channel is N. N. E. and S. S. W., two knots. If you fall to the southward of Martha's Vineyard, and can see Noman's Land Island, and intend going over the shoal to the eastward, bring Noman's Land Island to bear W., and steer E. by S., 8 leagues,

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* Gay Head light-house stands at the south-west end of Martha's Vineyard, on a remarkable promontory, called Gay Head, elevated above high water 134 feet, elevation of light above the sea, 150 feet.

The cliff, which rises about 134 feet above the water, is very conspicuous from the different colors of the earth, which have been exposed by the action of the elements.

The lights revolve once in about four minutes, and are observed twice in each revolution. At the distance of 12 miles they are obscured about three-fourths of the time: at 3 miles distance they may always be seen, though dimly, through parts of each revolution. Cape Poge light, at the N. E. point of the Vineyard, may be seen over the land from sea, is a fixed light, to distinguish it from that of Gay Head; also Cuttehunk light, at the N. W. part of Cuttehunk Island, south entrance of Buzzard's Bay, which is also a fixed light. The Devil's Bridge, a rocky shoal, makes off about S. W. from the light, one and a half mile distant. Bearings and distances from the light: West part of Noman's Land Island bears S. 8° W. from Gay Head, 6½ miles distant. The island is about three miles long and one broad. Old Man S. by E. This is a ledge of rocks which lies two-thirds of the distance from the Vineyard to Noman's Land Island, which has a passage on both sides that is but little used. Those who go through must keep near Noman's Land Island till the light bears north. You will have 7 fathoms water in this passage. Sow and Pigs, N. W. by W., 3½ leagues. This is a ledge of rocks which is very dangerous. Newport (Rhode Island) light-house, W. by N. ½ N., distant 11 leagues.

which will bring you up with Nantucket Island, to which you must give a distance of two miles, until you have passed Micomic Reef, which extends one mile from the shore, has two fathoms water, and bears from the South Tower at Nantucket S. by W. When you get to the eastward of this rip, you may nigh the shore to within one-quarter of a mile, until up with Tom Never's Head, which lies 1¾ of a mile to the southward and westward of a small village, called Siasconset, where you may anchor, if necessary, in 4 or 5 fathoms.

If you wish to continue through the channel, which lies between Nantucket Island and the Old Man, you may run within three cables' length of the shore, which will carry you over Pochick Rip, on which there are but 2 fathoms, and of course only fit for small vessels. When on this rip, haul to within one cable's length of the shore, and continue in 5 fathoms, till up with Sancoty Head, which is the highest eastern land of Nantucket. Bring Sancoty Head to bear S. W. when in 5 fathoms water, and run N. E. till you deepen to 15 fathoms, when the Round Shoal Buoy will bear N. W., after which you shoal into 7 and 8 fathoms, fine ridges, which having passed, and come into 10 fathoms, a north course will carry you to the high land of Cape Cod, 17 leagues distant. If in a large ship, and you make the south side of Nantucket, bound over the shoals, you may proceed either within or without the Old Man, but the latter is preferable.

If you wish to go between the Old Man and Pochick Rip, bring Tom Never's Head to bear N. W. by W., and run S. E. by E. till Sancoty Head bears N. N. W. ½ W., where you will have 9 fathoms water, when you will run direct for Sancoty Head, till in 5 fathoms, which will be close on board: then continue your course N. E., as before mentioned, for the Round Shoal. In running the S. E. by E. course, you go through a swash half a mile wide, having 7 fathoms.

If you are coming from sea, and make the Island of Nantucket to the northward of you, it may be known by two towers, and four windmills, which stand near each other, upon an eminence. You may then steer directly for the land, until you are within half a mile, and may, if bound to the eastward, run along the shore in 4, 5, and 6 fathoms water, to the S. E. part of the island, where there are shoals and rips, on which you will have only 2½ or 3 fathoms water. Sancoty Head is the easternmost headland of Nantucket.

If, in coming from sea, you make the South Shoal, which lies in 41° 4′ N. latitude, give it a berth of a mile. If you intend to make Nantucket Island, steer N. by W., and when you come near the island, you may proceed along the shore, according to the former directions.

If, when you make the South Shoal, you are bound to Boston Bay, and choose to go to the eastward of all the shoals and rips, pass a mile or two to the southward of the shoal, then steer N. E. by E., about 7 leagues, when you will be up with the Fishing Rip. In running this N. E. by E. course, you will deepen to 25 fathoms, which is about midway of South Shoal and Fishing Rip. From the Fishing Rip, in 17 or 18 fathoms, steer N. N. W. for the high land of Cape Cod, 18 leagues, on which is a light-house containing a fixed light.

If you come from the eastward, and are bound for Long Island, or New York, you should be careful not to go to the northward of 41° N. latitude, until you pass the South Shoal of Nantucket. If, by stress of weather, you should be driven so far to the northward as to be near the Vineyard, you may pass through the channel to the westward of Nantucket Island, by bringing Cape Poge light-house to bear N. by W., and steering right for it, will lead you through, in from 3 to 4 fathoms, clear of all shoals, leaving Skiff's Island, which is a dangerous shoal, on your larboard hand. Martha's Vineyard Island lies in much the same latitude as Nantucket Island, and may be known by a small round island which lies at the southward of Gay Head light, called Noman's Land Island, before mentioned, 8 miles distant. You may sail between this island and Martha's Vineyard; but you must take care to avoid a ledge of rocks which bears from Gay Head light S. by E., 5½ miles distant, called the Old Man.

In bad weather, coming from the eastward, and you wish for a harbor, and the wind admitting, you may bring Nantucket light to bear E. S. E., and run W. N. W., making your course good, until Cape Poge light-house bears W. by S.; if bound into Edgartown Harbor, then steer for the light until you get in 3 fathoms water, then run W. N. W.; if it shoalens, haul to the northward; if not, keep on until the light bears south, then run W. S. W.; you will have 3 and 4 fathoms, hard bottom. As soon as you get in 5½ or 6 fathoms, sucky bottom, then run S. S. W. until the light bears N. E. ½ E.; then you may anchor in about 5 or 6 fathoms water with safety, in case your cables and anchors are seaworthy; otherwise, if you wish to go into the harbor, when the light bears N. E. ½ E., you may run S. W. by W. until you get 3½ fathoms, hard bottom, then run west about half a mile, and you will be within the flats, which you leave on your starboard hand, coming in; you will find it smooth, and about 3 or 4 fathoms water, where you may anchor with safety, though your ground tackling is poor.

To enter the Vineyard Sound, bring Gay Head light to bear S. E., 4 miles distant, and steer E. N. E.

To enter Buzzard's Bay through Quick's Hole, bring Gay Head light to bear S. ½ W., and steer S. ½ E. to the entrance of Quick's Hole, which is six miles from Gay Head. Menemsha Bite, which lies on the north side of Gay Head, affords good anchorage 2½ to 3 miles east from the light, with the wind from E. to S. W., but being much exposed to the influence of northerly winds, it should be resorted to only in the summer, or at other times from necessity.

From Gay Head light-house, the south part of Cuttehunk Island bears N. 45° W., distant 7¼ miles.

If you wish to go to Holmes' Hole, or through the sound, bring Cape Poge light to bear S. E. by E. ¼ E., and run N. W. by W. ¼ W.; you will run for the East Chop, and leave Squash Meadow Shoal on your starboard hand; get 3 fathoms water on the chop, then haul to the N. N. W., until you deepen to 7, 8, or 9 fathoms; then run S. W. by W. for Holmes' Hole Roadstead, in 4 or 3½ fathoms, or N. W. for the sound, to clear the West Chop and Middle Ground.

Gay Head is the westernmost land of Martha's Vineyard. When you come by Gay Head with a southerly wind, the south channel is best. From Gay Head to Nantucket Point, the tide sets directly through the Vineyard Sound with a little variation, after passing Cape Poge to the eastward, which is caused by a strong tide setting through Tuckanuck Channel. The land of Gay Head is high, and of divers colors, namely, red, yellow, and white, in streaks. In steering from Block Island (which is about 9 miles in length, extending N. by E. and S. by W., and 5 miles in breadth) for Gay Head, you must be careful to avoid the Sow and Pigs; they make a ledge of rocks, some of which are above, and others under water. These rocks lie 2½ miles S. W. by W. from the westernmost of Elizabeth Isles, and W. N. W. from Gay Head 2⅔ leagues distant; the first of the flood tide sets strong to the northward over them into Buzzard's Bay, which is very foul. Your course along Elizabeth Isles is E. N. E., in 15, 14, 12, 8, 15, 16, and 17 fathoms water; give the isles a berth of about three-quarters of a mile. In running from Gay Head light into Vineyard Sound, if you wish to make a harbor on the north side, bring Gay Head light to bear S. W., and run N. E. 3½ leagues, which will carry you up with Tarpaulin Cove light, where you may anchor in from 4 to 18 fathoms, on fine sand, the light bearing from W. by N. to S. W., affording safe anchorage with northerly winds.

TARPAULIN COVE LIGHT lies on the larboard hand as you enter that harbor, and shows a fixed light, elevated 80 feet above the sea. It bears about N. E. by N. from Gay Head light, which is a revolving light, 3½ leagues distant.

When coming from sea, you may run for Gay Head light when it bears from N. N. E. to E. S. E., giving it a berth of 2 miles, to clear the Devil's Bridge, which bears from the light S. W., 1½ mile distant. As measuring the distance in the night would be uncertain, you must keep your lead going, and if you should have 7 or 8 fathoms when the light bears S. E. by E., or S. E., haul up north till you have 10 or 12 fathoms; then with flood steer N. E., and with ebb N. E. by E., 3 leagues; then E. N. E. will be the course of the sound, which will carry you to the northward of the Middle Ground, which has a black buoy on the east end, in 16 feet water, bearing from Tarpaulin Cove light E., 4 leagues; from West Chop light N. W. by W., half a mile; and from the black buoy on Hedge Fence W. ½ N., 3 leagues, (shoalest water on Middle Ground two feet) when you will see the West Chop of Holmes' Hole light, which you may run for; keep one mile from shore till you open the East Chop one cable's length, and with a flood tide steer direct for it, and with ebb keep it one point open, till you open a windmill on the west side of the harbor about one cable's length, then run up in the middle of the river, till you come to 4 or 3 fathoms, where you may anchor on good ground. The usual mark for anchoring is the West Chop, bearing from N. N. W. to N. W. by N.; but if you lie any time here, the best anchoring is well up the harbor, and close to the shore, mooring S. E. and N. W., in 4 or 5 fathoms water. In this harbor, which is about two miles deep, you will lie secure from all winds except a northerly one.

A light-house, showing a fixed light, is erected on the West Chop of Holmes' Hole, elevated 60 feet above the sea, as previously mentioned.

You must not keep further than two miles from the West Chop, as there is a shoal, called Hedge Fence, on the east end of which is a black buoy, in 16 feet water, bearing from West Chop east, 6 miles, and from the black buoy on Middle Ground E. ½ S., 3 leagues. The Hedge Fence lies about 3½ miles N. E. by N. from Holmes' Hole light, and extends W. N. W. and E. S. E. 6 miles, is about half a mile broad, and has 4 feet water on the shoalest part. Between this shoal and Holmes' Hole there are from 8 to 12 fathoms water.

If you make the chop in the night, when it bears S. E. you are clear of the Middle Ground; steer for the east side of it till you strike in 4 or 3 fathoms on the flat ground near the chop, then steer S. E. by E., observing not to go nearer the land than 3 fath-

oms. If, in running S. E. by E., you fall into 6 or 7 fathoms, haul up S. by W., or S. S. W., and run into 4 or 3 fathoms, as before directed.

If bound into Vineyard Sound, with the wind at the eastward, and you are near the south side of Martha's Vineyard, to go between Squibnocket and the Old Man, run round Squibnocket in 3½ and 4 fathoms water, continuing N. N. W. along the beach till you come to Gay Head light, and if ebb tide, anchor in 5 fathoms, the light bearing from N. to N. E.

Vessels entering the Vineyard Sound should leave Cuttehunk light on the larboard hand, giving it a berth of 3 miles, to avoid the Sow and Pigs, the western part of which bears S. 56° W. from the light, 2½ miles distant. Cuttehunk is one of the Elizabeth Islands.

CUTTEHUNK LIGHT stands on the south-west part of the island at the entrance of Buzzard's Bay, intended to guide vessels into the bay, and point out the location of the Sow and Pigs to those entering the bay and Vineyard Sound. It is a fixed light, elevated 48½ feet above the sea at high water.

Bearings from Cuttehunk Light-house.

West part of Sow and Pigs, very dangerous,	S. 56° W.	2½	miles.
Seconnet Point Rocks,	N. 71° W.	13	do
Old Cock, a rock north side entrance Buzzard's Bay,	N. 45° W.	5	do
Mishom Point,	N. 6° E.	6½	do
Dumplin Rock light-house,	N. 18° E.	8½	do
Clark's Point light-house,	N. 20° E.	12½	do
West Point Pune Island,	N. 34° E.	3	do
Gay Head light-house,	S. 42° E.	7	do

In entering Buzzard's Bay, bring Cuttehunk light to bear east, 3 miles distant, and steer N. E. by N., which course will carry a vessel to good anchorage, in 6½ and 7 fathoms, about one mile from the Dumplin Rock light, with it bearing from N. N. E. to N. E. by N. This is as far as a stranger should venture without a pilot, who can always be had on setting a signal.

In coming into the sound in the night, with a strong north-westerly wind, haul to the northward till you have smooth water under the Elizabeth Islands, where you may anchor in 14 or 10 fathoms. Should you have the wind to the southward, it will be best to run down through the South Channel, or Vineyard side. When Gay Head light bears S. S. E. your course is N. E. by E. ½ E., or E. N. E., observing not to come nearer the land than into 7 fathoms water, till you are abreast of Lambert's Cove, in which is good anchorage, with southerly or easterly winds, and may be known by a high sand bank, called Necunkey Cliff, on the east side of it, about midway the cove, opposite which you may come to in 5 or 3 fathoms, sandy bottom, where is the best anchoring. The Middle Ground lies about two miles without the cove, and has 12 feet water on it. If you intend running down for Holmes' Hole, your course, when opposite Necunkey Point, is E. by N., keeping near the land to clear the Middle Ground, the east end of which bears east from Tarpaulin Cove light, 4 leagues distant. You may track the shore by the lead in from 7 to 4 fathoms, till you come near the light; but come no nearer than 3 fathoms, and you may track the chop around, the same as running down to the northward of the Middle Ground, which bears from West Chop light, N. W. by W. half a mile, and from the east end of the Hedge Fence, W. ½ N., 3 leagues. There is good anchoring along this shore, in 6 or 4 fathoms, after you are to the eastward of Necunkey Point, till you come near the West Chop. If you wish to make a harbor after entering the Vineyard Sound, bring Gay Head light to bear W., distant 8 miles, and run S. E. till you come into 7 fathoms water, which will be on the east side of the bay in Nimshebite, near Clark's Spring, where the best water may be had in great abundance, and lie in good anchorage, Gay Head light bearing W. by N. Your course from Gay Head light to Tarpaulin Cove light, is N. E. by N., and the distance 4 leagues. In this harbor you may anchor in from 4 to 2½ fathoms, and lie safe, with the wind from N. E. by E. to south. It will be best to anchor in 3 fathoms, as with that water you will be out of the tide, where the ground is good for holding. The tide flows, at change and full days of the moon, at 9 o'clock, but in the channel between Elizabeth Islands and Martha's Vineyard, the flood runs till 11 o'clock. In this channel there is a Middle Ground, which is a narrow shoal of sand, the eastern end of which bears N. W. by N. from the light. There are not more than 3 or 4 feet on the eastern end. N. W. from Necunkey Cliff are 3 and 4 fathoms across the ground. Opposite Lambert's Cove are 12 feet, and to the westward of that, are 3 or 4 fathoms. The shoal lies W. by S. and E. by N., is about 4 leagues in length, and has several swashes on it. When the East Chop of Holmes' Hole comes open of the West Chop, you are to the eastward of the Middle Ground. Your course from Tarpaulin Cove light to Holmes' Hole light, is E. ½ N., distant 3 leagues. In steering this course, you must have regard to the tide, as the ebb

may set you too far to the southward, and the flood too far to the northward, and stand in for the harbor, when you have opened the East Chop, as before directed. From Holmes' Hole light to Cape Poge light, the course is E. S. E., and the distance about 3 leagues; in the channel between them there are 12 and 11 fathoms water. In going over the shoals through this cannel, you must be careful to keep your lead going, in order to avoid a dangerous sand which lies on the north side of it, called the Horse-shoe, distant from Cape Poge 3 leagues. The channel between this sand and Cape Poge, and also between the former and * Tuckanuck Shoal, is narrow; in it there are from 12 to 4½ fathoms water, the latter of which is between the east end of the Horse-shoe and Tuckanuck Shoal. When Tuckanuck Island bears S. S. W. you are to the eastward of the Horse-shoe. On the south side of the channel, also, there are several spots of shoals, to avoid which you must keep your lead going.

NEW BEDFORD, THROUGH QUICK'S HOLE.—Bring Gay Head light-house, which contains a revolving light, to bear S. ½ W. and run N. ½ E. till you come to the passage through the islands, which forms Quick's Hole, which you must enter as near the middle as possible; but if you deviate, keep the starboard hand best on board, to avoid a spit or flat which runs off from the S. E. point of Nashawina, on the larboard hand, when you will have from 5 to 6 fathoms, then haul square into the hole, keeping the larboard hand best on board, following somewhat the bend of the shore. You will keep Gay Head light open about a ship's length by the S. E. point of Nashawina, till you are at least one mile north of the hole, which will carry you to the eastward of a ledge and rock that lie that distance from it, with only 5 to 12 feet water on them, to the westward of which is a good channel, and 5 fathoms all round. Then steer N. ½ W. till you strike hard bottom in 5 fathoms water, on the S. E. corner of the Great Ledge, which is on the western side of the channel; then N. E. by N. about three-fourths of a mile, till in 5½ or 6 fathoms, sucky bottom, when the light will bear N. N. W.; then steer N. by W. and run into the river. † After passing ‡ Clark's Point light, you will see a small island called Outer Egg Island, just above water, which you will leave on your starboard hand, giving it some berth, as there are rocks which lie south-westerly from it, say one-third of a mile distant, but still keeping nearer to it than to the main land, to avoid Butler's Flat, which makes off from the west shore. To steer clear of this flat, keep the light-house open a ship's length to the westward of the Round Hills. As soon as you open the north line of the woods with the clear land, about a mile north of the light-house, you are to the northward of the flat, and may steer direct, either for the hollow or the high part of Palmer's Island, hauling a little to the eastward as you approach it. The passage between this island and Fort Point, on the starboard hand, is narrow. A flat which extends out S. W. from the point, makes it necessary to keep nearest the island. As you draw towards the north end of the island, give it berth of two ships' length, as a small flat makes off east from its N. E. point. As soon as you have passed the island one cable's length, the town will appear open on your larboard hand, when you may run for the end of the wharf which projects out farthest into the channel (Rotch's Wharf); or, to anchor in the deepest water, bring Clark's Point light without Palmer's Island.

Other directions from Quick's Hole to New Bedford are, to make a north course good till you strike hard bottom in 5 fathoms, on the eastern side of the channel, and then haul up N. N. W., but the former directions the pilots consider safest.

In coming into New Bedford from the westward, the eastern channel is safest for strangers. Give the Sow and Pigs a berth of one mile, and run N. E. by N. till Pune Island bears S. E.; then E. N. E. till Gay Head light bears S., and then N. ½ W. as before directed.

A rock lies off N. W. from the north end of Pune (or Puneguese, as it is sometimes called) about one mile distant, on which there are only 8 feet at low water. Between this and Wilke's Ledge (on which there is a black buoy) is an open ship channel, free from danger, and courses may be varied as circumstances require. By those who are acquainted with the bay, the western channel is most commonly used. Giving the Old Cock, Hen and Chickens a sufficient berth, the only danger to be avoided in approaching Mishom Point, is a rock which lies about one mile S. W. by S. from it, on which there are only 6 feet water. Having passed Mishom Point, directly south of which, one

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* Tuckanuck Shoal lies between Cape Poge and Tuckanuck Island. On the shoal a floating light is moored.

† When running from Quick's Hole for the N. Ledge, as soon as you find yourself in 7 fathoms water, you may be sure that you are abreast of the Great Ledge, or have passed it.

‡ Clark's Point Light-house stands on the south end of Clark's Neck, containing a fixed light, elevated 52 feet above the level of the sea, at high water, and is intended to guide vessels into the harbors of New Bedford and Fairhaven. The light bears from Cutterhunk light, S. 20° W., 12½ miles distant.

From the light to Dumplin Rock light, S. 24° W. 4 miles.
" " Centre Quick's Hole, S. 10° E. 10 do.
" " Black Rock, S. 54° E. 2½ do.

mile distant, there is a ledge, on which there are not more than 3 fathoms at low water, and sometimes less, you may steer directly for the Dumplin Rock light, off the Round Hills, and which may be passed within two cables' length to the eastward. Hence to Clark's Point light the course is N. N. E.; but to avoid the Middle Ledge, (on which there is a red buoy,) and which lies very near in a direct course from the outer Dumplin to the light, it is better to steer N. E. by N. about a mile, and then haul up N. N. E.; when you will leave the ledge on your larboard hand. You may also carry in 4 fathoms to the westward of the ledge, but the channel between it and the Lone Rock, which lies N. W. from it, is narrow.

DUMPLIN ROCK LIGHT, is on one of the Dumplin Rocks in Buzzard's Bay, six miles S. S. W. from Clark's Point light-house. The lantern is on a tower on the centre of a dwelling-house, showing a fixed light, forty-three feet above the sea. The following are the bearings: Clark's Point light-house, N. N. E. distant 5 miles; Buoy on Middle Ledge, N. E. by N. ½ N. 2 ½ miles; Buoy on North Ledge N. E. ½ E. 3 miles; Buoy on Great Ledge, E. ½ S. 2 miles; Wood's Hole E. by S. 15 miles; Quick's Hole S. by E. ¼ E. 12 miles; Buoy on Wilke's Ledge, S. by E. ½ E. 2½ miles; Pine Island, S. by W. 10 miles; Cutterhunk light-house, S. S. W. 12 miles; Sow and Pigs, S. S. W. ½ W. 14 miles; Mishom Point, S. W. ½ W. 2 miles; White Rock, N. ½ E. half a mile.

When bound to sea a S. W. by S. course from the Dumplin Rock light will carry you just without the ledge south of Mishom Point, and in a fair channel way between the Sow and Pigs, and Hen and Chickens.

From Seaconnet Rocks (giving them a berth of one mile) to the entrance of Buzzard's Bay, the course is E. ½ S. By this course made good, all the dangers of the Hen and Chickens will be avoided. Soundings generally, from 9 to 7 fathoms, and mostly hard bottom, till it deepens to 16 fathoms, sucky bottom, when Cutterhunk Island light will be upwards of a mile distant, and Clark's Point light will bear N. N. E., and you may run directly for the light till up with the Dumplin Rocks, to which a sufficient berth must be given. Or you may stand on this N. N. E. course till in 7 fathoms, sucky bottom, which will be between Mishom Point and the Round Hills, and come to anchor; or otherwise, steer N. N. E. till Pune Island bears S. E., and then E. N. E. for Quick's Hole channel, as before directed. It may be well to observe, that if, when you have stood in from Seaconnet Point towards Cutterhunk Island light, and the light on Clark's Point is not to be seen, but you can see Gay Head light, you may stand on your course E. ½ S. till you shut it in behind the west end of Cutterhunk, but must then immediately change your course to N. N. E. If neither light is to be seen, the soundings are the only dependence, and must be very carefully attended to. In light winds you must take care the flood tide does not carry you into Buzzard's Bay, or on the Sow and Pigs.

ADDITIONAL REMARKS.—To the S. E. of the Dumplin Rock light, one-half to three-quarters of a mile distant, is a sand spit with only 7 feet of water on it. Between this spit and the rocks, there are 5 fathoms water.

Lone Rock, on which a black buoy lies, about 35 feet S. by E. from the rock: from which, Clark's Point light-house bears N. N. E.; Outer Dumplin Rock, S. by W. ½ W.; Round Hill S. W. ¾ S.; White Buoy at Hussey's Rocks S. W. by W., distance by estimation, one mile. The entrance of Apponeganset River N.W., and N. W. of the Middle Ledge, nearly half a mile distant, is nearly or quite dry at low-water, when there are 2 ½ fathoms round it. Between this rock and the Hussey Rock is the entrance to Apponeganset River; depth of water, in the channel, 3½ fathoms. There is also a channel between the Hussey Rock and White Rock. Course from Quick's Hole to entrance of Apponeganset River, N. N. W.

The White Rock, on which a white buoy lies, about 40 feet S. S. E. from the Hussey's Rocks, from which Round Hills bear S. S. W.; White Rock south, and distant by estimation, one mile; Clark's Point light-house N. E. by N.; Buoy at the Lone Rock N. E. by E. and the entrance of Apponeganset River, N. N. W. appears considerably high above water, and the two rocks to the westward of it, called the Rugged Rocks, are always to be seen.

A small rock to the S. W. of the North Ledge, (about one mile distant from the buoy,) with only 7 feet water on it, and another small rock to the N. E. of the same ledge, (about half a mile distant from the buoy,) with 10 feet water on it, were recently discovered by Capt. Mosher. On the former he struck with the brig Commodore Decatur, and on the latter with the brig Elizabeth.

Packet Rock, a small sunken rock, on which there are 4 feet water, lies half a mile, or upwards, W. by N. from Black Rock. The passage for coasting vessels bound from New-Bedford up the bay, is between Packet and Black Rocks.

The soundings across the western entrance of Buzzard's Bay, between the Sow and Pigs, and Hen and Chickens, and some distance within them, are very irregular, varying from 5 to 10 and 15 fathoms, and bottom generally hard.

A south-east moon makes high water in the bay, and the average set of tide is 1½ knot.

Bearings of ledges from Clark's Point light.

North Ledge, ...S. by E.
Middle Ledge, ...S. by W. ½ W.
Great Ledge, ...S. ¼ W.
Wilkes' Ledge, ...S. by W.
West's Island Ledge (buoy,) .....S. E. by E.

Other bearings from the light.

Old Bartholomew Rock, ...E. 26° N., one sixth of a mile distant.
Quick's Hole, ...S. 9° E.
Dumplin Rocks light, ...S. 21° W., or S. S. W., nearly.
White Rocks, ...S. 25° W.
Round Hills, ...S. 20° W.

From the North Ledge.

The light-house bears, ...N. by W.
Black Rock, ...N. E. by E.
Dumplin Rocks light, ...S. W.

From Middle Ledge.

Light-house, ...N. by E. ½ E.
Dumplin Rocks light, ...S. W. by S. ½ S.

From Great Ledge.

Light-house, ...N. ¼ E.
Mishom Point, ...W. S. W.
North Ledge, ...N. N. E., 2 miles distant.
Dumplin Rocks light, ...W. ½ N.

From Wilkes' Ledge.

Light-house, ...N. by E.
Mishom Point, ...W. by N. ½ N., 2 miles distant.
Dumplin Rocks light, ...N. by W. ⅓ W., about same distance.

From West's Island Ledge.

Lighthouse, ...N. W. by W.
Mishom, ...W. S. W.
Little Black Rock, ...N. by E.
Black Rock, ...N. W. ¼ W.

BUZZARD'S BAY.—The entrance of Buzzard's Bay lies between Bird Island on the N. W., and Wing's Neck on the S. E. Sailing for Monument River, the best water is near to Wing's Neck, and from the point of Wing's Neck, nearly up to the southernmost of Tobus Islands, are from 4 to 6 fathoms water. Near to the Island, (Tobus,) commences a ridge of flats, extending over to the N. W. shore, on which are 7 to 9 feet water. Having passed over this ridge, you will have from 15 to 20 feet water, which depth you may carry until abreast of a large single rock, called the Old Cow, which lies about one-quarter of a mile from the shore, when you will come up with a ridge of hard sand, from 100 to 120 fathoms wide, on which are from 7 to 9 feet water, which, after passing, you will have from 18 to 22 feet water, quite up to Back River Harbor. The soundings are reduced to low water. Rise from 3 to 6 feet. High water at full and change of the moon at 8 o'clock.

Bird Island is on the north shore of Buzzard's Bay, near the east side of Sippican Harbor, in the town of Rochester, about 12 miles E. N. E. from New-Bedford light-house. It is small, not containing more than three acres of land, and is about five feet above the level of the sea. The light and dwelling-houses are built of stone, and are white-washed. The tower of the former is 25 feet high, on which is a lantern 7 feet high. It is a revolving light; time of revolution 3½ minutes.

There are three of the Tobus Islands, but at low water they are all connected.

BUOYS IN BUZZARD'S BAY.—There are 5 buoys placed in Buzzard's Bay, viz: A yellow buoy on the S. E. part of the North Ledge, in 2½ fathoms water; a red buoy,

lying in very shoal water, on the centre of the middle, which is a small ledge; a white buoy on the S. E. part of the Great Ledge, in 3 fathoms water; a black buoy on the S. W. part of Wilkes' Ledge in 2½ fathoms water—all on the western side of the bay; and a white buoy in 2 fathoms water, on West's Island Ledge, on the eastern side.

All these buoys, except the one on West's Island Ledge, are taken up in the winter.

Bearings and distances from Bird Island light-house.

The south point of West's Island, ...S. W. ¾ W., 10 miles.
West's Island Ledge, ...S. W. ½ W., 11 miles.
The north entrance of Quick's Hole, ...S. W. by S., 25 miles.
Wood's Hole, due .....S., 10 miles.
The entrance of Monument River, ...E. N. E. ½ N., 7½ miles.

Bearings and distances of sundry places in the vicinity of Buzzard's Bay.

From Wing's Neck to the lighthouse on Bird Island,.....W. by S., 2½ miles.
Minister's Neck, ...S. by E., ¾ of a mile.
From Great Rocky Point to the south end of Mashow Island, S. W. ½ W., ⅚ of a mile.
Hog Island,.....W. by S., ½ of a mile.
Wing's Neck,.....S. W., 3 miles.
Tobus Island, ...S. S. W. ⅞ of a mile.
Old Cow Rock,.....S. by E. ½ E., ⅛ of a mile.
From the south end of Mashow Island to Bird Island .....S. W. by W. ½ W., 4½ miles.
Wing's Neck,....S. W. ½ S., 2⅜ miles.

WEST ISLAND LEDGE BUOY.—West Island Ledge lies in Buzzard's Bay, between five and six miles S. E. by E. from New-Bedford light-house, in from 4 to 4½ fathoms water. A large white buoy has been placed over the ledge.

The following are the bearings by compass, from Rhode Island light-house, of several remarkable places, together with the distances, viz:

Block Island, (S. E. point,) .....S. W. by S. ½ S.
Point Judith light,.....S. W. ¼ S., distant 2 leagues.
Block Island, (S. E. point,) .....S. W. ¾ S., or S. W. by S., nearly.
Block Island, (middle,) .....S. W. ½ S., distant 6 leagues.
Block Island, (S. E. end,) .....S. W. by S. ½ S.
Whale Rock, ...W. ¾ S.
Brenton's Reef,.....E. S. E. ¼ E.
South point of Rhode Island.....E. ½ S.
Highest part of Castle Hill,.....E. N. E. ¼ E.
Brenton's Point,.....N. E. by E.
Fort on Goat Island,.....E. N. E. ½ N.
South-easternmost Dumplin, ...N. E. ¾ E.
Kettle Bottom, ...N. E.
Newton's Rock,.....S., near 200 yards.

N. B. The anchoring place between the town of Rhode Island and Coster's Harbor, N. E. by E.

WAREHAM HARBOR, IN BUZZARD'S BAY.—This harbor can only be attempted in the day time; and the only safety is to keep in between the buoys, of which there are 9 in number, leaving, in going in, the black buoys on the starboard hand, and the white on the larboard.

NED'S POINT LIGHT-HOUSE is situated on the north side of Buzzard's Bay, and on the east side of Mattapoisett Harbor, about one mile S. E. from the village, and contains a fixed light. The tower is built of stone, and white-washed, standing 45 feet from the sea to the S. W., and 250 feet from the sea to the S. E. The lantern is elevated 40 feet above the level of the sea.

Bearings and distances from Ned's Point light-house.

A buoy on Nye's Ledge, S. 20′, half E., distant two and a half miles.

A buoy on S. E. point of Mattapoisett Ledges, 10½° E., distant one and seven-eighths of a mile.

A buoy on Snow's Rock, S. 10° E., distant three and one-quarter miles.

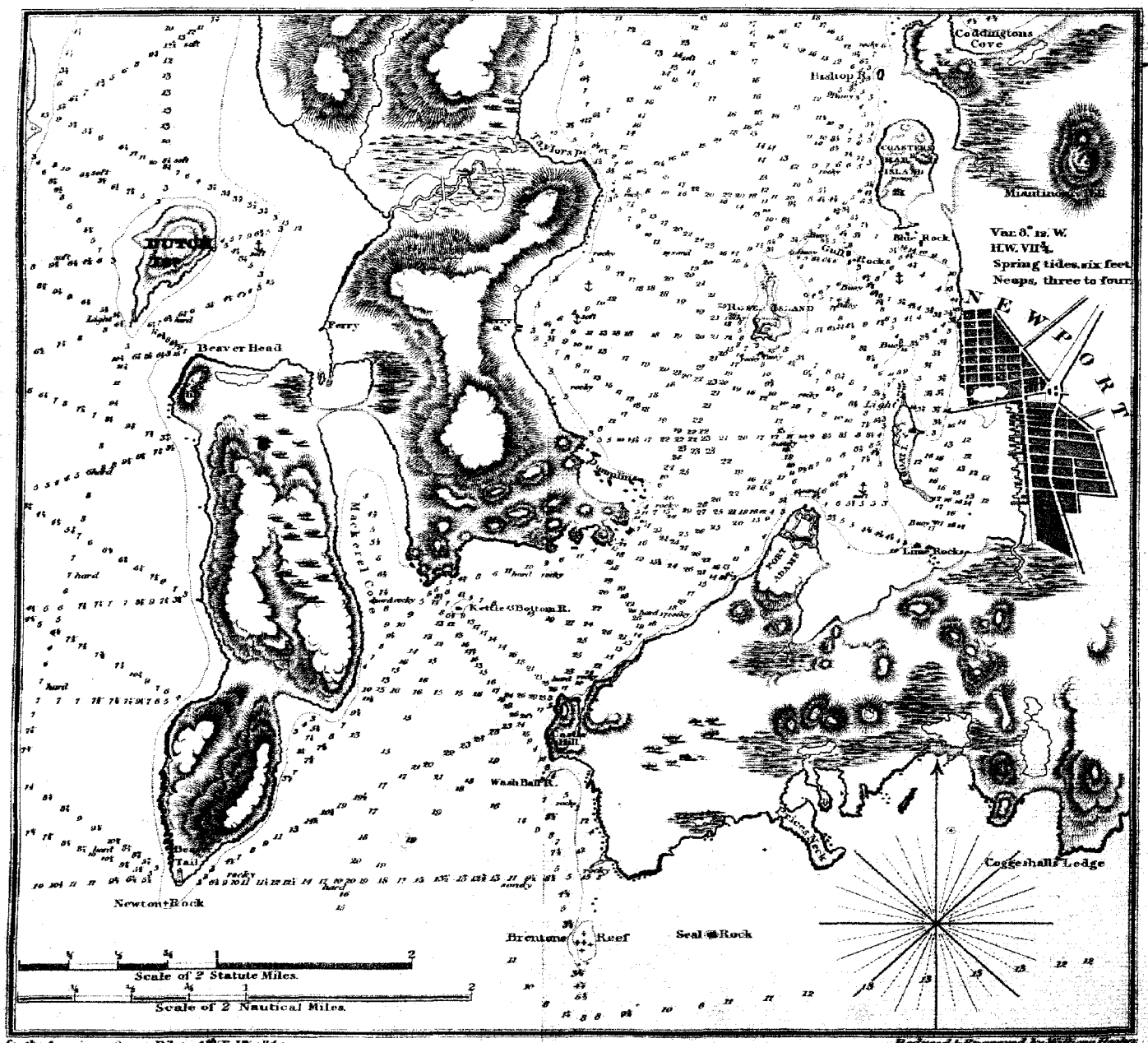
A buoy on N. W. part of Mattapoisett Ledge, S. 3½ W., distant one and a half mile.

Cormorant Rocks, S. 4°, half W., distant three and a half miles.

Angoloco Point, S. 55° E., distant one and three-quarter miles.

Wood's Hole, S. 22°, half E., distant nine miles.

NEWPORT HARBOR, BY CAPT WADSWORTH, LTS GEDNEY, WILKES & BLAKE, U. S. N.



for the American Coast Pilot 14th Edn 1844.

E & G.W. Blunt, 179 Water Street, New York, 1838.

Reduced & Engraved by William Hooker

Before coming up with West Island, Bring Bird Island light to bear N. E. by N., and run for it until Ned's Point light bears N. N. W., half W., when you may haul up N. W. half W. In running this course, you will pass a buoy, painted white, with two black stripes around it, which stands on the middle of Nye's Ledge, in two and one-half fathoms water; this ledge is about a quarter of a mile over, either way, and not more than eight feet water on some parts of it. Continuing this course, you will pass a buoy on your larboard hand, painted white, with three black stripes around it, which stands on the S. E. part of Mattapoisett Ledge, in two and one-half fathoms of water. Continue the above course, and you will pass two buoys, one on your starboard, and the other on your larboard hand; the latter stands on the east side of the sinking ledge, in three fathoms of water; the former stands by the side of the Snow rock, in two and one-half fathoms of water. This rock has eight and one-half feet water on it. Keep midway until you pass them, when you may steer N. W. by W., until Ned's Point light bears east, when you may anchor in three fathoms water, good bottom.

There are two other buoys not named above; the one stands about N. E. from Snow Rock, in three fathoms of water, by the side of the Barstow Rock; the other on the extreme point of Ned's Point, in two fathoms of water.

Mattapoisett has a fine harbor, and easy of access.

RHODE ISLAND HARBOR.—*Directions for those coming from the south-westward, who fall in with Block Island light; from the westward through Long Island Sound; or from the eastward, when bound for Rhode Island Harbor.*

Two light-houses are erected on the N. W. point of Block Island, showing fixed lights, bearing N. and S., distant 25 feet from each other, and elevated 58 feet above the level of the sea. From the point extending into the sea, in nearly a N. ¾ E. course, is a shoal, making it dangerous for a vessel to pass within two miles of the light. From this shoal, Montock Point light-house bears S. W. by W. ½ W.; Point Judith Point light-house, N. E. by N.; Watch Hill light-house, W. N. W.; Clay Head, (Block Island,) S. E. by E.; rocks off Clay Head, S. E. by E. ½ E.; and the S. W. part of Block Island, S. S. W. ¾ W.

The two lights cannot be made separate when to the northward, unless in a position to make Point Judith light N. E., when they appear like the lights of a steam-boat.

Vessels coming from the southward, or south and westward, will make Block Island. Give it a berth of about one mile, on the east and west sides. The two lights situated on the N. W. point of this island, are so near together, they appear as one light until you are within two or three miles of them. Off the N. W. Point, a shoal makes out N. ¾ E., which renders it dangerous for large ships to pass within two miles of the lights. Point Judith light bears from these lights N. E. ¾ N., distant 11 miles. After passing Point Judith, follow the directions given below for sailing into Newport.

The light-house on Point Judith is a stone edifice, 40 feet high. The lamps are 60 feet above the level of the sea, and contain a revolving light, to distinguish it from Newport light, which stands on Conannicut Island, and is a fixed light. The distance from the light-house to high water mark, is as follows: E. from the light-house to high water mark, 16 rods; S. E., 14 rods; S. 18 rods; S. S. W., 23 rods; which is the extreme part of the point, to which a good berth should be given. The light on Point Judith bears S. W. ¼ S., 2 leagues distant from Newport, (Rhode Island) light-house. Point Judith light may be distinguished from Watch Hill light, by the light not wholly disappearing when within 3 leagues of it.

From the S. E. part of Block Island to Rhode Island light-house, the course is N. by E. ¾ E., and the distance 7 leagues: about midway between them there are 24 fathoms water. If you are on the west side of Block Island, with the body of the island bearing E. N. E., in 8 or 10 fathoms water, your course to Point Judith light is N. E. by E., about 6 leagues. This point appears like a nag's head, and is pretty bold; between Block Island and the point there are from 30 to 6 fathoms water, except a small shoal ground, which, in thick weather, is often a good departure, say 4 to 5 fathoms, bearing about W. by S. from Point Judith light, distant 3 miles. From Point Judith, when not more than a quarter of a mile from the point to Rhode Island Harbor, your course is N. E., and the distance is about 8 miles. When in 13 fathoms water, Point Judith light bearing W., or W. by N., the course to Rhode Island Harbor is N. E. by N. ½ N., and the distance to the light-house 2 leagues. The light-house, together with the Dumplins, must be left on your larboard hand; it stands on the south part of Conannicut Island. This point is called the Beaver's Tail, and is about 2 leagues distant from Point Judith.

Conannicut Island lies about 3 miles west of Newport, the south end of which (called the Beaver's Tail, on which Newport light-house stands) extends about as far south as the south end of Rhode Island. The light-house on Goat Island bears N. 60° E. from the light on Conannicut Island, and Kettle-bottom Rock N. E. The east shore forms

the west part of Newport Harbor. The ground the light-house stands upon is about 12 feet above the surface of the sea at high water. From the ground to the top of the cornice are 50 feet, round which is a gallery, and within that stands the lantern, which is about 11 feet high, and 8 feet in diameter. It contains a fixed light.

A sunken rock lies south of Beaver Tail, called Newton Rock, on which it breaks if there be any sea, distant 200 yards from Rhode Island light-house.

A little within the light-house, and near to the shore, on the west side, there is a cove called Mackerel Cove, the entrance to which is shoal and dangerous. As both ends of these islands are pretty bold, you may pass into the anchoring at either end, and ride nearer to Goat Island side than to that of Rhode Island, as the other parts of the harbor are grassy, and would be apt to choke your anchors. Rhode Island is navigable all round, by keeping in the middle of the channel.

GOAT ISLAND lies before the town of Newport, about 5 miles N. E. from Newport light, and has a light-house on the north end, containing a fixed light, from which the following bearings have been taken:—Newport light-house bears S. 60 W., equal to S. W. by W. $\frac{1}{4}$ W., distant 5 miles; west shore of Castle Hill, S. 54 W., or S. W. $\frac{3}{4}$ W., $2\frac{5}{8}$; Brenton's Point, S. 51 W., or S. W. $\frac{1}{2}$ W., 1; South Dumplin Rock, S. 70 W., or W. S. W. $\frac{1}{4}$ W., $1\frac{5}{8}$; Conannicut Ferry, N. 71 W., or W. N. W. $\frac{1}{4}$ W., $2\frac{1}{4}$; south point of Rose Island, N. $58\frac{1}{2}$ W., or N. W. by W. $\frac{1}{4}$ W., $\frac{7}{8}$; Gull Rock, N. $11\frac{1}{4}$ W., or N. by W., $\frac{3}{4}$; west shore of Coster's Harbor Island, N., $1\frac{1}{8}$; buoy on the north point of Goat Island, N. 50 E., or N. $\frac{1}{2}$ E., $\frac{1}{4}$. Large vessels go south of the buoy.

Narraganset Bay lies between Conannicut Island and the main. Your course in is about north, taking care to avoid Whale Rock; you may pass in on either side, and anchor where you please. From the light-house on Conannicut Island to Gay Head, in Martha's Vineyard Island, the course is E. by S. $\frac{1}{2}$ S., and the distance 9 leagues.

You must take care to avoid the rocks which lie off south from Castle Hill, some of which are above water. Castle Hill is on the east side of Rhode Island Harbor, N. E. from which is Fort Adams, from the north end of which a reef extends.

Vessels coming from the eastward, to clear Brenton's Reef, bring Newport light to bear W. N. W., and steer for it until they see Goat Island light from the deck, which will then bear N. E. $\frac{3}{4}$ E.; then run for Goat Island light until it bears E., (or continue your course until it bears E. S. E.,) at the same time keeping Newport light bearing S. W. by W., and anchor in 7 to 9 fathoms, good bottom. In coming from the west, after passing Point Judith, (the light-house whereon has a revolving light,) steer N. E. by N., until you draw up with Newport light, to which giving a berth, run for Goat Island light, and anchor as above directed. Goat Island lies before the town of Newport, extends about north and south, and has a fort on it; off the N. E. point lies a buoy in 16 feet water.

A large white buoy is also placed at the end of the shoal, which makes out from the south end of the island, in 10 feet water. The shore on the north and south ends is rocky, and you must not attempt going between the buoys and the island.

Vessels coming from the westward through Long Island Sound, bound to Rhode Island, will leave Fisher's Island on the larboard hand, and steer E. by N., which will carry them to Point Judith, keeping in not less than 10 fathoms water, giving the point a berth of one mile, when you will see Newport light bearing N. E. $\frac{1}{4}$ N., distant 6 miles; steer for it, leaving it on your larboard hand: you will then steer for Goat Island light, which bears from Newport light N. E., distant about 5 miles; keeping the latter bearing S. W. by W. until you bring Goat Island light to bear E., or E. S. E., and anchor in from 7 to 9 fathoms water, good holding ground. Between Newport light and the North Dumplin, you will have from 18 to 28 fathoms water.

If, after passing Point Judith, as before directed, you wish to proceed toward Providence through the West Passage, your course is N. E., leaving Newport light (on Conannicut Island) on your starboard hand, half a mile distant, when your course will be N. by W., $1\frac{1}{2}$ league, to Dutch Island light,* which you also leave on your starboard hand, one-quarter of a mile distant, from which you steer N. $\frac{1}{2}$ E., 14 miles, for the light on †Warwick Neck, leaving it on the larboard hand, one-quarter of a mile, where you may anchor in 3 fathoms water, as it is not safe to proceed further without a pilot, unless you choose to depend on finding the channel, which is marked out by stakes.

In entering this passage, keep nearest Conannicut Island, to avoid the Whale Rock, which bears from Newport light S. 82° 30′ W., distant about three-fourths of a mile, with some scattering rocks north and south of it.

BUOYS AND SPINDLES PLACED AT NEWPORT HARBOR.—A spindle on Saddle Rock, eastward of Rose Island, on either side of which there is a passage.

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* Dutch Island light-house is erected on the south part of the island, and shows a fixed light.

† Warwick Neck light-house is erected on the south part of Warwick Neck, and shows a fixed light. A spar buoy is placed on Long Island Point, off Warwick Harbor, $1\frac{1}{2}$ mile distant, which must be left on the larboard hand going into East Greenwich.

A spindle with a ball, on a rock at the south end of the island, which you leave to the northward.

One red buoy, with a cross, on Dyer's Reef, south part of Coaster's Harbor, which you leave on the starboard hand.

One on the ledge off the Bishop's Rock, called the Triangle Rock, on either side of which you may pass, giving the buoy a berth.

One red spar buoy at the south, and one at the north end of Gull Rocks, both of which you pass to the eastward.

One spar buoy on Providence Point, which is the north end of Prudence Island, to the northward of which is the main channel.

NEWPORT TO PROVIDENCE.—Pass half-way Rock, which lies nearly in middle of the river, about 5½ miles from Newport, and 1½ mile from the south end of Prudence Island; there is a passage on both sides of the rock. West from Prudence Island lies Hope Island, having a passage all round, giving the N. E. end a small berth.

From the Triangle Rock, which lies off the Bishop Rocks, on which is a buoy that may be passed on either side, to Warwick Neck light, the course is N. ¾ W. After leaving Prudence Island 3 miles N. E. by N. from Warwick Neck light, you pass on your larboard hand a spar buoy, which you may go very close to. E. ½ S. from Warwick Neck light lies a spar buoy, which you leave on the starboard hand. When Warwick Neck light bears W., steer N. N. E. for Nyatt Point light, leaving the spar buoy on Providence Point on the starboard hand, and running so far to the eastward as to bring Prudence Island to bear south, by which you leave the Middle Ground, which has a buoy on it, on the larboard hand. Nyatt Point light is on the starboard hand, and 9 miles from Providence. Soon after passing the light you come up with a pyramid, directly opposite the village of Patuxent, the base of which is painted black, with a white top, erected on a ledge of rocks, which you may approach very near, leaving it to the larboard hand. At a short distance you come to another pyramid, and a stake, both which you leave on your larboard hand. One-fourth of a mile from the last pyramid lie Lovett's Rocks, having a spar buoy on them, which must be left on the starboard hand, going very near to them.

BRISTOL HARBOR.—Bristol Harbor lies 9 miles from Newport, and east of Warwick light. At the mouth of the harbor lies Castle Island, having a pyramid on it, which is left on the starboard hand, and a red buoy on the larboard, steering N. E. when entering.

STONINGTON LIGHT-HOUSE shows a fixed light, on the extreme point of land at Stonington, and bears from Watch Hill Point light-house N. W. ½ W., 2 miles distant; from Naper Tree Point, N. N. W. ¾ W., 1½ mile; from Catumbsett Rocks spindle, N., 2⅛ miles; Wicopessett, N. by E., 2 miles; Latimore's Reef, N. E. ½ E., 2 miles; Wamphasgett Shoal, E. ½ N., half a mile; North Dumplin, E. by N. ¾ N., 5½ miles distant.

STONINGTON HARBOR AND FISHER'S ISLAND.—If off the south-east part of Fisher's Island, bring the highest steeple in the town of Stonington open to the east of Stonington light-house, and steer for it N. 6° E., until Watch Hill bears east, when you will have passed through Lord's Channel, which is between the spindle on Wicopessett Island Ledge and the spindle on Catumb Ledge, you will then be in 12 to 13 fathoms water, then steer north-westerly to clear the shoal water extending from Bartlett's Reef, until the light bears N. by E., when you may steer directly for the light-house, or the breakwater, into the harbor.

If you should be to the eastward of Watch Hill light, and bound through Fisher's Island Sound, give the light a berth of one-third of a mile, and steer W. ½ N., until the light on Stonington Point ranges with the highest steeple in the town, when you may steer as above directed into Stonington; or, if bound west, you may continue your course on, passing the spindle on Latimer's Reef, on your starboard hand, about 150 yards, until Stonington light bears E. N. E., and the house on Ram Island N. W., when you may steer W. S. W., and pass directly between the North and South *Dumplins, which are two small islets of moderate height. On steering the last course, you will leave Ellis' Reef, on which is a spindle, on your starboard hand, and East Rock, Middle and West Clumps, on your larboard; the three last are reefs of rocks trending W. by S. and E. by N., between the South Dumplin and Latimer's Reef.†

Should you go the southern channel, you will, on passing Latimer's Reef, keep over towards Fisher's Island, and steer about W. ½ S., to avoid East Rock, and the Middle and West Clumps, which are nearly covered at high water, until the centre of what is

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* The North Dumplin is bold to, except on the east side.

† In this harbor, Lieut. Blake, of the U. S. Coast Survey, has found the two following rocks:—
YOUNG'S ROCK, which just washes, lies south of Latimer's Reef.
BLAKE'S ROCK, 4 feet water, a short distance east from Latimer's Reef Spindle.

called *Flat Hummock bears N., distant three-fourths of a mile, and the west point of Fisher's Island in sight, bearing W.; New London light-house will then be open between the South Dumplin and Fisher's Island, when you may steer for it N. W. ½ W., keeping in mid-channel, to avoid the shoal water off the west point of West Harbor, and the shoal which puts off between the South Dumplin and the Flat Hummock, in the form of a horse-shoe, until you have passed the Dumplins, when you are clear of all danger. South of the Dumplins and Flat Hummock, is the west harbor of Fisher's Island, where there is good anchorage in 2½ fathoms, soft bottom, Flat Hummock bearing N., and the west point of the harbor W. N. W. Ellis' Reef, on which is a spindle, lies south of the house on Ram Island, distant about one-third of a mile, between which there is a very narrow passage of 5 fathoms water. Potter's Reef lies N. W. ½ W. from the North Dumplin, distant one mile, between which there is a fine passage, free from all danger; this reef is of small extent, and has a spindle on it, which may be passed on either side. W. ½ S. from Ram Island, and half way to Potter's Reef, is the extreme point of Groton Long Reef. This is a conspicuous point on Fisher's Island Sound, and may be known by being cleared of trees at the south part: it is not to be approached from the south nearer than half a mile. A shoal, called the Horse-shoe, lies west of Groton Long Point, and N. E. from Potter's Reef; as there is no spindle on the Horse-shoe, vessels should avoid going much to the north of Potter's Reef.

There is good anchorage to the east of Groton Long Point, in 2¼ fathoms, soft bottom, distant from the shore one-third of a mile.

After you have passed Fisher's Island Sound, you should be careful to keep the South Dumplin in range with the N. E. point of Fisher's Island, to clear the Triangle Rocks, which form the south point of Bartlett's Reef, on which there is a buoy. When Two-tree Island bears N. by W., or Little Gull N. by E., you are past this danger, and may follow the general directions up the sound.

If bound through from the westward, you should on no account go to the southward of the South Dumplin. but should, after passing either between the Dumplins, or to the north of them, bring Stonington light to bear E. N. E., and run for it until the Break-water bears N., when you may steer for the anchorage.

If you wish to pass through the sound, when Stonington light bears E. N. E., and the house and Ram Island N. W., steer E. ½ S. for Watch Hill light, leaving Latimer's Reef on your larboard hand, and giving Nappertree Point and Watch Hill Point a berth of about one-third of a mile, leaving Watch Hill Reef, on the east end of which is a spindle, on your starboard hand. This spindle bears from Watch Hill light S. S. W. ¾ W., distant about two-thirds of a mile. A rock, with 6 feet water on it, lies south from Watch Hill Point, distant about one-eighth of a mile.

Fisher's Island Sound is perfectly safe with the foregoing directions, and to be preferred if bound east on the flood, or west with an ebb tide, to going through the race; but it should not be attempted without a leading wind, by strangers, and great attention should be paid to the lead.

The Eel-grass Shoals lie between Ram Island and Stonington light, and extend in spots for some distance; the largest of these shoals lies south of the †White Rock, but you are clear of them when Stonington light bears E. N. E.

RHODE ISLAND LIGHT AND THROUGH THE SOUND.—The first course from Rhode Island light-house, on Beaver Tail Point, is S. W. ¼ S., distant 2 leagues to Point Judith light; thence from Point Judith light through the race to ‡Little Gull light, the course is W. by S., 11 leagues distant, leaving §Watch Hill Point light, Stonington light, and Fisher's Island on your starboard hand, and Little Gull light on your larboard hand. You must be careful to avoid a reef which runs off from the west of Fisher's Island, W. S. W. towards Race Rock, on which is a spindle, distant one mile from the point of the island, and which you must leave on your starboard hand, and continue your course until the Little Gull is south of you, if the tide should be flood, about one mile; if the tide should be ebb, you should, as soon as the Little Gull bears west, and ‖ New London light in range with the highest steeple in the town (N. 2° W.) steer north-westerly, until it is south of you 2 miles, when you may steer W. ¼ N. for

* Flat Hummock is a barren sandy island, of a few acres in extent.

† White Rock lies E. N. E. from Ram Island, half way to the light-house on Stonington Point, and is always conspicuous.

‡ Little Gull light is situated on Little Gull Island, at the entrance of Long Island Sound, through the race. This light may be considered as the key to the sound. The lantern is elevated 50 feet above the level of the sea, and contains a fixed light.

§ Watch Hill light is situated on Watch Hill, at the entrance of Fisher's Island Sound. The lantern is elevated 50 feet above the level of the sea, and contains a revolving light.

‖ New London light is located at the entrance of the harbor, on the western side. The lantern is elevated 80 feet above the level of the sea, contains a fixed light, and bears N. by E. from Little Gull light, about 2½ leagues.

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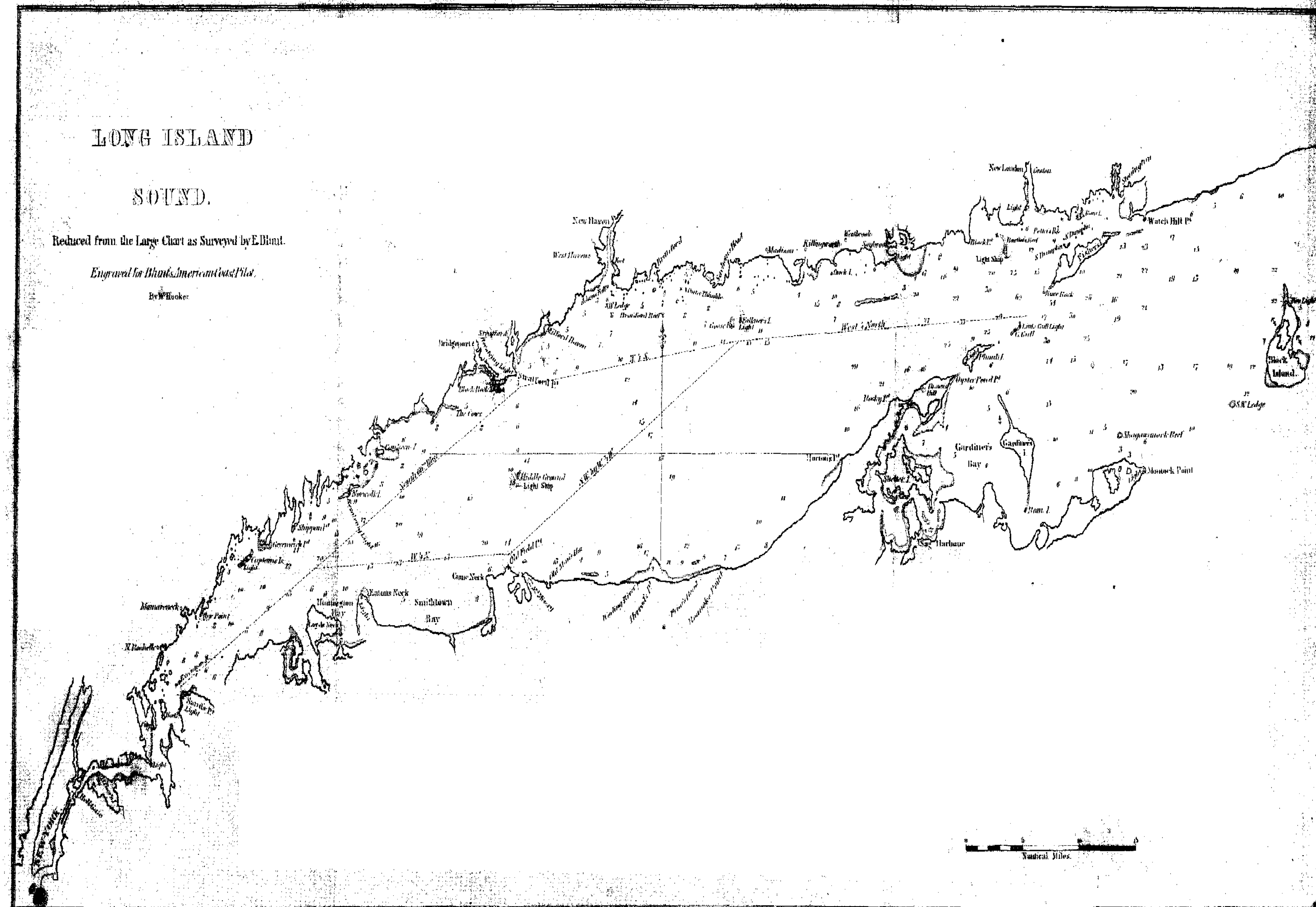

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* Falkner's Island light, distant 8 leagues, on which course you should be careful to avoid the Long Sand Shoal, off Cornfield Point, and which extends east and west 5 miles. Should you make the above courses good, you will, when off Cornfield Point, be 1½ mile south of the shoalest part. This shoal is very narrow, and as you approach it, you will shoalen your water from 12 to 2 fathoms very suddenly. You should in the night time come no nearer to Falkner's Island, when north of you, than 14 fathoms, (three-fourths of a mile distant,) when you may steer S. W. by W. ¾ W. for † Old Field Point light, 8 leagues, which carries you to the south of the Middle Ground. You should come no nearer Old Field Point than 8 fathoms, (distant half a mile,) in the night; and when it bears south of you, steer W. ¼ N. 17 miles, which will take you to the north of Loyd's Neck, in 13 fathoms water, leaving Norwalk light, which is revolving, on your starboard hand, and ‡ Huntington light (on Eaton's Neck) on your larboard hand, from whence you may steer S. 66° W., which will take you between § Sands' Point and Execution Rocks, on the latter of which, on the east end, is a buoy, bearing N. by W. from the light, distant seven-eighths of a mile. If, when up with Falkland Island, you should prefer going to the north of the Middle Ground, steer W. ¼ S. for ‖ Stratford light 20 miles, and giving it a berth of half a mile, in 3½ fathoms water, steer S. 66° W. for Sand's Point light-house.

In case of flood tide and southerly wind, when you come through the Race, your course should be W. ¾ S. until you come up with Old Field Point light, distant 16 leagues, taking care to allow for the tide, which runs very strong, and flows on the full and change days of the moon until half past 11 o'clock. In coming up with Old Field Point light, you should not bring it to bear to the west of W. by S. ½ S., on account of a shoal off Mount Misery, or if in the day time, keep Crane Neck, which is a bluff, two miles to the west of the light, open clear of the light, and pass the point in 8 fathoms, as above directed.

If a ship could have a fair departure from the middle of the Race, and is compelled to run in a dark night, or in thick weather, the best course would be west 15 leagues toward Stratford light, as it would afford the largest run on any one course, and if made good will carry you 1½ mile south of Stratford Point light in 6 fathoms water, and 4 miles to the north of the Middle Ground; on this course you will leave Saybrook, Falkland Island and New Haven lights on your starboard hand, ¶ Plumb Island light on your larboard hand, and will pass three miles south of Falkland Islands in 17 fathoms water. When up with Stratford light, and it bears north 1½ mile distant, your course to Sand's Point light is W. S. W. 11 leagues. West of Stratford light 1½ mile is Point-no-Point, which is shoal for some distance from the shore, but you are clear of it when Black Rock light bears W. ¾ N.

Should you wish to anchor under Falkner's Island, there is good holding ground on the east or west side in 2½ and 3 fathoms water, but the best place with the wind from the west, is close to the N. E. point of the Island, the light-house bearing S. W. by S. in 2½ fathoms. North from the island a narrow shoal puts off one-quarter of a mile, and is bold to, but you are to the north of it, when the centre of Goose Island bears S. W. by W., and when the light bears S. E. by E. you may run for it and anchor.

The passage inside of Falkner's Island is perfectly safe, but you should not, in standing over towards the Connecticut shore, bring Hammonasset Point to the south of east. This point may be known by having two small bluffs at the extremity, and it bears E. N. E. from Falkner's Island, distant 5½ miles. When standing to the S. towards Goose Island, you should be careful of the shoal extending to the north of it, and you are just clear of

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* Falkland Island light-house is elevated 75 feet above the level of the sea, and exhibits a fixed light.

† The light-house on Old Field Point shows a fixed light, elevated 67 feet above the sea, and 27 feet from the base. Is bears from Eaton's Neck light N. 89° 6′ E., 12¾ miles distant. From Stratford light S. 9° W., 10⅞ miles distant. From Black Rock light S. 19° 4′ E., 11 miles distant. From New Haven light, S. 34° 28′ W., 18¾ miles distant.

‡ Eaton's Neck light-house, fronting from the east round north to the south-west, elevated 134 feet above the level of the sea, and 49 feet 8 inches from its base, showing a fixed light. It bears S. 5° 15′ E. from Norwalk light, distant 5 miles and nine-tenths. A reef extends from the light N. N. E. half a mile, on which are a number of rocks.

Vessels should not come nearer the shore than three-fourths of a mile, when the light bears between west and south. On the west side the shore is sandy and pretty bold.

§ Sands' Point light-house is N. 42° 30′ E. from Throg's Point light, distant 4 miles and six-tenths. The rocks extend from the shore opposite the light, N. W. one-eighth of a mile.

‖ Stratford light-house contains a revolving light. The revolution is such as to exhibit the light once in 90 seconds. From it Old Field Point light, on Long Island, bears S. 9° W.; New Haven light N. 63° E., 10 miles distant; Middle Ground S. 3° W., 5½ miles distant; Black Rock light S. 88° W.

¶ A light-house, elevated 63 feet above the level of the sea, exhibiting a revolving light, is erected on the west end of Plumb Island, and will be of great advantage to vessels bound to the eastward or round Montock Point, when, through stress or foggy weather, it is not prudent to go through the Race.

it when Falkner's Island light bears E. S. E. and Goose Island S. by W. in 2½ fathoms, rocky bottom; after you have passed Goose Island you should keep more to the southward, to avoid Whetton's and Brown's Reef lying off the Thimble Islands, and Branford Reef, which is dry at very low tides: on this reef is a buoy bearing from Falkner's Island light W. ¾ N., distant 6¾ miles, and from New Haven light S. E. by E. ¾ E., distant 5 miles. To the north of Branford Reef there is a good passage, but it should not be attempted by strangers without a favorable opportunity; but in case you should be compelled to navigate as during the late war, you may, after passing Goose Island, bring the light-house to bear E. S. E. and steer W. N. W. for the Outer Thimble, giving it a berth of 30 or 40 yards, then steer W. ½ S., on which course, if made good, you will keep the outer Rock of the Thimble in range with the large Hotel on Sachem's Head, astern of you. Vessels of any draft of water may go through this passage, and you will leave Whetton's Reef, which is one-fourth of a mile S. S. W. from the outer Thimble, and Brown's Reef, on which there is a buoy, on your larboard hand, and Thimble Buoy to the west of the Thimble, half a mile, and the buoy on the Nigger Heads, on your starboard hand; this range takes you within 100 yards of the Nigger Head Buoy, and about seven-eighths of a mile north of Branford's Reef, when you may steer W. by S. ½ S. for Stratford Point. Goose Island is W. S. W. from Falkland's Island, one mile distant.—It is shoal on the East and North sides, and a resting place for gulls, which are purposely left undisturbed, as their noise serves to give notice of your approach to the island in thick weather.

S. ½ W. from Stratford light, distant 5½ miles, is the Middle Ground, the entrance of which bears from Eaton's Neck light E. by N. ¾ N., 15 miles. From *Black Rock light S. E. ¼ S., 7½ miles; and from Old Field Point light N. by E. ¼ E., distant 5 miles. On this shoal are two feet water at low tide; on the south side is a white spar buoy, and on the north side a black spar buoy, both in 19 feet water, bearing nearly N. by E. and S. by W. from each other, half a mile distant. You may go on either side of the shoal you please: on the north are from 3 to 11 fathoms, and on the south side from 8 to 24 fathoms water; a mile either to the east or west of this shoal you will have 12 fathoms.

A ledge lies off the N. E. point of Eaton's Neck, three-fourths of a mile from the shore, but after the light bears S. E., the shore is bold to all the way up on the east side of Huntington Bay, where you may anchor in easterly winds.

In beating up sound, when Eaton's Neck light bears S. W. by S., you should not stand over to the north shore nearer than to bring Norwalk light to bear W. by S. ½ S., on account of the reef which puts off from Caukeen Island E. by S. 1½ mile, and on which there is a buoy. When Goose Island, which is the first island S. W. from Caukeen, is west from you, you are south of the reef. There is a passage for small vessels between these islands, but to the west of Goose Island there is no passage, as the reefs extend to the buoy on Green Ledge, one mile W. by S. ½ S. from Norwalk light. W. by S. from Norwalk light, 3 miles distant, is Long Neck Point: there is good anchorage to the eastward of it when the light bears E. from you, but when you are to the west of Long Neck Point, you should be careful of Smith's Reef, which lies S. W. one mile from it, and also of a reef called the Cows, which is also S. W. from Long Neck Point, 2¾ miles, and south from Shippan Point, three-fourths of a mile, on both which there are buoys, and they are bold to until you are close on the rocks. After you pass the Cows, the first point is Greenwich Point, which is bare of trees, and is the S. E. point of a neck of land running into the sound, the S. W. point of which is called Flat Neck Point, and covered with trees; the water off both these points is shoal. The easternmost of the Captain's Isles lies S. W. by W. from Flat Neck Point, 1¼ mile distant, between which is a fair passage; but in going in, you must keep half way between Flat Neck Point and the island, on account of the rocks extending N. E. from the island, and S. E. from the point, and steer north, and when Flat Neck bears east you may anchor. The passage between Captain's Islands and the main should not be attempted by a stranger. Captain's Islands are three in number, the largest of which is the westernmost one, which has a light-house on its east end, showing a fixed light, bearing from Norwalk light W. by S. ¾ S., distant 10½ miles; from Eaton's Neck light, W. by N. ¼ N., 11 miles, and from Sand's Point light N. E. ½ N., 9 miles. You may approach near these islands, but after you have passed them to the west, you should keep at least half a mile from the shore, on account of several rocks and reefs between those islands and Rye Point.

On the south shore of the sound, after passing Eaton's Point to the westward, is Loyd's Neck, the north point of which is low and sandy, E. by N. from which is a reef on which

* Black Rock light is on Fairweather's Island, at the entrance of Black Rock Harbor. This edifice is of an octagon form, built of stone, 19 feet diameter at the base, and rises to the height of 31 feet, surmounted with a platform of masonry, which supports the lantern 40 feet above high water mark.

there is a buoy, lying off the highest bluff, half a mile from the shore: the reef is very small, and has 3 fathoms close to it. To clear this reef and the Sandy Point, you should not bring Eaton's Neck light to the N. of E. ½ S. in passing it. To the west of Loyd's Neck is Oyster Bay, in standing in towards which you should be careful of the shoal which puts off from the north point of Hog Island, in a N. N. W. direction, nearly a mile; you are to the north of it when Oak Point is open of a hill on Matinicock Point (S. W. by W.) and Cooper's Bluff, which is the highest up the bay, is open clear of the east point of Hog Island, (S. S. E.,) when you may steer S. E. for the eastern side of the bay, to clear the Middle Ground, and make a harbor either in Cold Spring or Oyster Bay, keeping but a short distance from the shore.

One mile east of Sand's Point light is the Pulpit, a large rock on the shore; when this rock is between S. S. W. and S. E. from you, you should not bring Sand's Point light to bear W. of S. W., on account of a reef of rocks off it, and in standing to the north, you should, when the light is S. by E. from you, make but short tacks, on account of the Execution Rocks, which lie N. N. W., seven-eighths of a mile, from the light, and also on account of some scattering rocks, one-eighth of a mile from the point. After you pass the point, your course is S. W. for the south point of Hart Island, on which course you pass Success and Gang Way Rocks, on both which are buoys, left on the larboard hand on the above course, although you may go on either side of them. Success Rock is bare at low water, and is S. W. from the light-house on Sand's Point, about one mile. Gang Way Rock has 6 feet water on it, and is one-sixth of a mile W. N. W. from Success Rock, lying (as its name imports) in mid-channel. The south point of Hart Island has two single trees on it, and is bold to. The course from this to *Throg's Point light is S. S. W. ¼ W., on which course you will leave the buoy on the Stepping Stones on your larboard hand, and you may stand over to the westward, guided by your lead, but as you come up with the Stepping Stones, which is about half way, do not bring the trees on Hart Island to bear to the N. of N. N. W., and give Throg's Point a berth of one-eighth of a mile. You may, after passing Throg's Point light, steer west towards Whitestone Point, which is the first point on your larboard hand, and Old Ferry Point, which is beyond it, on your starboard hand, between which and Throg's Point there is good anchorage. Other bays that put in, to the west of Old Ferry Point, are shoal until you are beyond Waddington's Point, which is opposite Riker's Island. Between Old Ferry and Waddington's Point are Clauson's and Hunt's Points, the former of which has a buoy off it, and both are shoal for a short distance. South of Clauson's Point, and nearly two-thirds over to the Long Island shore, is a reef of rocks, on which there is a buoy, which must be left on the larboard hand: you open Flushing Bay when you come up with it, and from mid-channel may continue your course on west from the north point of Riker's Island, which is bold to; you can anchor to the westward of it in such water as you think proper, with the north point bearing east.

HART ISLAND affords good anchorage either in easterly or westerly winds. To anchor on the east side you may stand towards a barn which is in the bend towards the south part of the island, and anchor in 3 fathoms, the trees bearing S. S. W., distant half a mile. Should you wish to anchor on the west side, between that and City Island, you may haul close round the south part of Hart Island, and anchor west of the trees, in such water as you think proper.

HUNTINGTON BAY has a fair entrance and sound ground. There is good anchorage in Lloyd's Harbor, in 2 fathoms water, secure from all winds. To enter it, steer S. W. ½ S. from the light, when it bears N. E. ½ N., until the north point of Lloyd's Harbor, which is a low sand point, is W. from you, when you may steer directly into the harbor, leaving Sandy Point 20 yards on your starboard hand.

In going in or coming out of Lloyd's Harbor, you should be careful of the shoal water which is to the east of the Sandy Point, and on the west side of Huntington Bay.

SHOALS IN THE SOUND.—We will now notice more particularly the shoals in Long Island Sound.

Hatchett's Reef, to the east of Connecticut River: it bears E. ½ S. from Saybrook light-house, and S. S. W. from Hatchett's Point, and is dangerous. Between this reef and the shore is Burrow's Rock, lying W. N. W. from it. Strangers should not approach the north shore on account of these reefs, the bar off Connecticut River, and the shoal off Cornfield Point.

Should you want a pilot to enter Connecticut River, by making a signal off the bar, they will come on board. The bar extends 1¼ of a mile from the shore.

To the S. W. of Norton's Point, which is on the Long Island side, and S. E. from Falkner's light, the water is shoal for the distance of 3 miles, but from thence the shore is bold until you come up with Roanoke Point, a distance of 10 miles; after passing this point, you should not come nearer to the shore than one mile, until you are west of Wad-

* Throg's Point light-house stands on the south-east point of Throg's Neck, and contains a fixed light.

ing River, on account of a shoal off the *Friar's Head, and Herrod's Point; after passing Wading River, you may come within half a mile of the shore, till nearly up with Mount Misery, when you should not bring Old Field Point light to bear W. of W. by S. ½ S., on account of a shoal already described.

SECOND DIRECTIONS FOR BLACK ROCK HARBOR.—Bring the light on Fairweather Island to bear N. ¼ W., and run for it, if it should be in the day time, when on that bearing it will range with a single hill, situated in the interior several miles, which you must keep in range, until you are distant half a mile from the light-house; you will then have passed the spindle on the Cows, and will be in 4 fathoms water, when you may steer N. N. W. until the light bears E. by S., leaving a rock S. by W. from the light, on which is a buoy, on your starboard hand, when you may anchor; in steering the above courses you will have 5 fathoms, when up with the spindle on the Cows, and it shoalens gradually.

MONTOCK POINT LIGHT is on the east end of Long Island, bearing W. by S. from the S. W. point of Block Island, 4 leagues distant. From Montock light-house to the west point of Fisher's Island, N. W. by N., 13½ miles distant. The light-house contains a fixed light, elevated 100 feet above the level of the sea.

BLOCK ISLAND TO GARDNER'S BAY.—Montock Point, the easternmost part of Long Island, is 4 leagues W. by S. from the S. W. point of Block Island, on the N. W. point of which are two light-houses; between the island and the point there are 16 and 18 fathoms water. As you approach the point, you will quickly come into 9, 7, and 5 fathoms water. A flat runs off from the above point, on the outer part of which there are 5 fathoms water, rocky bottom, and S. by W. from the light, 9 miles distant, lies Frisby's Ledge, extending N. W. and S. E. 4 miles, with from 8 to 15 fathoms on it, hard rocky bottom, and deep water very near.

Between Montock Point and Block Island there is a shoal with only 4½ fathoms on its shoalest part, on which the sea breaks in moderate gales from the southward. It lies nearly half way between the Point of Montock and the south-west part of the island. W. by S. from the latter, and about E. ¾ N. from the light-house on Montock, distant 8½ miles, you suddenly shoal your water from 13 to 6 fathoms on the N. W. side of the shoal, and before you get a second cast of the lead you are over the shoalest part, into 7, 8, 10, and 12, and then into 14 fathoms. The rippling of the tide is very conspicuous when approaching the shoal in fine weather, and the sea breaks on it so in bad weather, that, even in small vessels, it is recommended to avoid coming near it, especially in southerly, or S. W. gales. You will suddenly shoal from 13 to 9 fathoms, and Montock light bearing W. ¾ S., 8 miles distant, you will have 5½ fathoms. The soundings from the shoal towards Montock are 6, 9, 14, 13, 11, 10, and 9 fathoms. Towards the light-house, when it bears from W. to S. W. by W., the bottom is strong; towards the shoal the bottom is coarse sand, and a very strong tide. A shoal runs off from the north side of Block Island, 2 miles.

From Montock Point a reef runs off in a N. E. direction, 2 miles, having a bed of rocks on its outer end, with 10 and 8 feet on them, on which the sea constantly breaks, or the tide causes a great rippling. They may be easily avoided by keeping a good lead going. In rounding Montock, come no nearer than 9 fathoms, or keep the two bluffs, or high parts of the land, (to the westward of Montock,) open one of the other, until Willis' Point comes open of Montock False Point. These marks will carry you clear of all the shoals in 3½ and 9 fathoms, and a N. by W. course will then carry you clear of the Shagawanock Reef, which lies N. W. ½ N., 3½ miles from Montock light-house, and has 6 feet on its shoalest part, 6 fathoms on the N. E. and N. W. sides, 3 and 4 fathoms on the S. E. and S. W. sides, and 3, 4, and 5 fathoms between the shoal and Montock False Point. The tides set strong round Montock Point; the flood N. E., and ebb to the contrary. At the Shagawanock the flood sets W. by S., and ebbs to the contrary. When on the Shagawanock in 6 feet, anchored a boat, and took the following marks:

1. Willis' Point in a line with the westernmost point of Fort Pond Bay, or the bay closed by the points being brought in a line S. W. by W. ½ W.
2. Montock False Point S. about 1½ mile.
3. The White Cliff, or high sand hills, on the west end of Fisher's Island, called Mount Prospect, N. by W. ¾ W.
4. The Gull Islands N. W., and the bluff sand cliff of Gardner's Island, W. Montock False Point is 2 miles N. W. from the light-house. Willis' Point is the easternmost point of Fort Pond Bay.

In rounding Montock in the night (when the land or light can be seen) with westerly gales, you may anchor when the light-house bears S. W. by S. in 8 or 9 fathoms, coarse

* The Friar's Head is a remarkable sand hill to the east of the Horse and Lion, which resembles the bald head of a friar, it being bare of trees on the top, and the soil white. The Horse and Lion are two small spots in the bank, bare of bushes, which some years ago resembled those animals.

sand. Having brought Montock to the southward of west, the weather thick, you cannot clearly ascertain the distance you are from the point; the lead must be your guide. Steer as high as W. N. W., until you have got into 9 fathoms. Steer off again into 13, and if you suddenly shoal from 10 to 6, steer off E. by N. until you are in 11 or 12, which suddenly deepens, (as a bank of not more than 5½ fathoms extends from the N. E. Reef to the Shagawanock,) and a good lead kept going will prevent you going too near these shoals, by steering off into 12 and 13 fathoms, before you attempt to steer to the westward, after having sounded in 6 or 7 fathoms. In the day time, having rounded Montock, and bound to Gardner's Bay, steer N. by W. until you clearly discover that Fort Pond Bay, and the red cliff on the western point, are open of Willis' Point; you may then steer W. by S. for the bluff point of Gardner's Island, and you will pass between the Shagawanock and Middle Ground, or Cerberus Shoals.

The Middle Ground (or Cerberus) is a rocky shoal, having from 2¾ to 5 fathoms on the shoalest part: the north and east sides are steep, having 10 and 15 fathoms within half a cable's length of the shoalest part. It extends N. by E. and S. by W. three-quarters of a mile. The south and west sides shoalen gradually from 13, 10, 9, 8, 7, to 5 fathoms, sandy bottom. It lies N. W. ½ N., 7½ miles, from Montock light-house; E. S. E. 7 miles from the Gull light; S. W. by S. 9¾ miles from the light-house on Watch Hill Point; 5½ miles S. by E. ½ E. from Mount Prospect, or the high sand hills on the west end of Fisher's Island. The tide in general makes a great rippling over the shoalest part. To avoid these rocks in the day time, observe a conspicuous hill, with a notch in its centre, at the back of New London, called Pole's Hill. This kept a ship's length open, either to the eastward or westward of Mount Prospect, (or the sand hills of Fisher's Island,) will keep clear of the rocky shoal in 10 or 15 fathoms to the eastward, and in 8 or 9 fathoms to the westward. The tide sets strong over the shoal. In calm or little winds, ships should anchor before any of the marks or bearings are too near.

Being bound for New London, and having brought the Gull light W. by N., and the light on Watch Hill N. E., steer so as to open New London light-house of Fisher's Island; and when the spire of New London church is in one with the gap on Pole's Hill, steering with it in that direction will carry you between the Race Rock (on which is a spindle, or beacon) and the Middle Race Rock, on which are 17 feet at half flood, and lies about half way from the Race beacon and the Gull light, or you may bring New-London light-house a sail's breadth to the eastward of the church spire, bearing N. 5° E., which will carry you to the westward of the Middle Race Rock, or between that and the Gull light-house. You may then steer direct for New London light-house.

About 3 miles within Montock Point, 1½ mile from the shore, lies a reef, bearing N. W. ½ N. from the point, on which there are 6 feet water, which is very dangerous.

S. by W., about 9 miles from Montock light, is a small fishing bank, having 8, 10, 11, and 15 fathoms on it, before mentioned.

In the offing, between Montock and Block Island, it is high water at half past 10, full and change, but on the shore two hours sooner.

Montock False Point is about 2 miles W. N. W. from the true point. The Shagawanock, or Six Feet Rocky Shoal, lies N. 1½ mile from it, and has been previously described. Willis' Point is on the east side of the entrance of Fort Pond Bay. This bay is very convenient for wooding and watering; the ground is clear and good, and you may anchor in any depth you please. In a large ship you may bring Willis' Point to bear N. E., and even N. E. by N., and then have in the middle about 7 fathoms water. Near the shore, at the bottom of the bay, there is a pond of fresh water.

The N. E. part of Gardner's Island is 5½ leagues W. N. W. from Montock Point. With westerly winds you may anchor off this part of the island, which is sandy; the marks for anchoring are the light-house of Plumb Island N. W., and the south part of Gardner's Island in sight, bearing S. by W. or S.; you will have 12 or 10 fathoms water. The bottom is sand and mud.

The entrance of Gardner's Bay is formed by the north end of Gardner's Island, and the south end of Plumb Island. If you are bound through the sound towards New York, your passage from Gardner's Bay is between the west end of Plumb Island and Oyster Pond, through which channel you will have from 4 to 20 fathoms water. When going into the bay, you may go within a cable's length of Gardner's Island, where you will have 10 fathoms water. You should be careful not to go too near *Gull Rock, as there is a rocky spot one and a half mile from it, on which there are 3 fathoms at low water. This shoal lies with the following marks and bearings, viz.:—A house on Plumb Island (standing about one-third of the way between the middle and the north-east end) on with the northernmost of the two trees which appear beyond the house; the north end of Plumb Island to bear N. N. W., or N. by W. ½ W., and the southernmost end of Plumb Island on with the northernmost point of Long Island. In order to avoid this

* This is a single black rock between Plumb Island and Great Gull, and called "Old Silas."

rock, when going into, or coming out of Gardner's Bay, you must be sure to keep the south point of Plumb Island open of the north-west point of Long Island, whilst the house on Plumb Island is on with the northernmost of the two trees, as before mentioned. There are several trees, but they appear, when viewed at a distance, to be only two trees. This shoal is called by some the Bedford Rock, because the English ship Bedford grounded on it, August 15, 1780. E. by N., one league from Plumb Island, lies a dangerous reef, which extends to the Gull Islands, and the passage between is not fit to be attempted, as there are several rocks, some of which may be seen. In Gardner's Bay you may anchor in what depth of water you please, from 5 to 8 fathoms.

On the S. W. side of Gardner's Island there is very good riding. If you are to the eastward of this island, with an easterly wind, and wish to take shelter under the south-west side, you must give the north-west end of the island a large berth, as above directed, and as you open the west side of the island, you may haul round the north-west point, and anchor where you please. The soundings are regular.

Ships, in turning up into Gardner's Bay, and standing to the southward, will observe a single conspicuous tree on the south-east part of Plumb Island, and tacking before it is brought to touch the south end of the wood on Plumb Island, will avoid the Superb's Reef, which lies E. by N. ¼ N. from the low point on Gardner's Island, one-third of a mile distant. It then extends S. E. by E. about two-thirds of a mile, and is about 200 yards broad: three fathoms on the middle, 6 fathoms close to the north-west end, 4, 4½, and 5 fathoms close to the south-east end, 5 and 6 fathoms close to the east side, lying parallel with the low point of the island. To avoid this shoal, the leading mark into Gardner's Bay is to keep Plumb Gut a ship's breadth open. Stand to the northward until Plumb Gut is nearly closing on the north-east bluff of Long Island, nearly touching the south-east point of Plumb Island, and until New London light-house is brought to the north and west of the Gull light-house, but tack before the points close, or stand into no less than 7 fathoms water, otherwise you may shoot over on the Bedford Reef, which is a bed of rocks, about 30 yards wide and 400 long, lying S. E. and N. W., with 16 or 17 feet on its shoalest part. You may anchor in Gardner's Bay in 5 or 6 fathoms. New London light-house kept a ship's breadth open to the eastward of Plumb Island will run you up into the middle of the bay, into the deepest water, and out of the tide. Ships going in through the race, or going out of New London, in order to avoid the middle Race Rock, (which has only 17 feet on it at half flood, and lies about half way from the Race beacon and the Gull light-house,) having from 30 to 32 fathoms on the north side, and from 10 to 30 on its south side, should observe the following marks:—Going out of the roads, and to the westward of the rock, which is the best channel, bring the spire of New London church a sail's breadth open to the westward of the light-house; keep this mark until a grove of trees, standing on a high hill on Fisher's Island, comes on with the east side of Mount Prospect, or the white sand hills on the S. W. side of Fisher's Island, N. 60° E., or the Gull light W. S. W. The tide flows at the Gull 11 h. 30 m., full and change.

To go to the northward of this rock, and to the southward of Race Rock beacon, bring New London church spire in one with the middle of the gap on Pole's Hill, at the back of New London (N. 8° W.;) keep this mark until Watch Hill light-house comes a little open of the south side of Fisher's Island, N. 70° E., and when the Gull light-house is in one with the middle of Great Gull Island, S. 73° W., you are then to the eastward of the rock. Coming up the sound through the Race, bring Watch Hill light-house just open of the south side of Fisher's Island, until the South Dumplin comes open to the northward of the north part of Fisher's Island, or until New London light-house bears north; you are then to the westward of the Race Rock, and may steer for the light-house of New London, and anchor in the roads, with Montock light-house S. E. by S., then just open of the west point of Fisher's Island, Gull light-house S. W. by S., and New London light-house N. by W., and the gap and spire of the church in one. You will have 12 fathoms, stiff clay bottom.

Going to the westward through the race, and to the southward of the Race Rock, steer for the Gull light-house, keeping it to the northward of west until New London light-house bears N. ½ E., then steer for it, leaving the Gull light-house half a mile on the larboard hand.

The first half flood sets N. W., the last half about W. N. W., and the ebb E. S. E.

The above to be observed in case the weather should be thick, and New London church spire not to be seen, or when the Gull light-house bears S. by W. You may then steer N. N. E. for the roads, making allowances for tides, which are very strong in the race. Flood runs to the westward till 11 h. 30 m. full and change days of the moon; but in New London roads only 9 h. 30 m. It rises 5 or 6 feet, spring tides. The flood sets through the roads, first half flood W. N. W., last half W. S. W. Ebb, first quarter, sets S. S. E., the last three-quarters S. E., for the south-west point of Fisher's Island.

Vessels bound eastward through the Race, in the night, when abreast of Gull Island light, with the tide of flood and a leading wind, should steer E. by S., or E. S. E., until

Gull Island light bears W. by S.; preserve that bearing until you see Stonington light over the low land of Fisher's Island; they are then clear of Race Point and Race Rock. The spring tides in the Race run about 5 knots per hour; neap tides about four knots. High water, full and change, at 11 o'clock. The first half flood sets N. W., the last half about W. N. W.; consequently, upon steering E., or E. by N., which is the Sound course, they have a strong tide upon the starboard bow, which forces them over to the northward, and instead of making, as they suppose, an E., or E. by N. course, which often carries them on Race Point, from which runs out far off a reef of rocks under water.

To go through Plumb Gut to the westward, give Pine Point, which is steep, a berth of 2½ cables' length, and steer so as to bring the north bluff of Plumb Island N. by W. ½ W. Keep it in that bearing until you have brought the poplar tree clear of the east end of Mr. Jerome's house, or until you have got Pine Point to the southward of east; you will then observe a wood close inland of the high bluff of Long Island, which, when bearing W. ½ S., will be in one with the rocky point, which is the next point to the Oyster Pond Point. Steering with the wood and this point in one, will carry you clear of the reef, which lies off the north bluff.

In running through to the eastward, keep the point over the middle of the wood before mentioned, until the poplar tree is to the west end of the house; then steer to the southward, giving Pine Point a berth as before. Pine Point E. ½ S. will lead clear of the shoals coming to the eastward.

The tide runs 6 or 7 knots in the gut. The flood sets about N. N. W., and the ebb S. S. E. It flows at 10 o'clock on the full and change days of the moon.

Marks for the Valiant's, or Middle Race Rock, which has only 17 feet on it at half flood, and lies about half way from the Race beacon, and the Gull light-house.

1. New London light-house in one with two conspicuous trees, which stand on the declivity of a hill, at the back of New London, being remarkable for a gap on its summit, N. 4° W.

2. The west side of the South Dumplin just touching with the north hill or point of Fisher's Island, N. 41° E.

3. The east bluff point of the Great Gull Island in one with the west lower extreme of Little Gull Island, or the Gull light-house, a small sail's breadth open to the eastward of the east part of Great Gull Island, S. 64° W.

4. The north end of Long Island just shut in with the N. W. point of Plumb Island, S. 76° W.; Gull light-house S. 63° W., and Mount Prospect, or high white sand hills on Fisher's Island, N. 60° E.

Marks for the New Bedford Reef, a bed of rocks about 30 yards broad, and 400 yards long, lying S. E. and N. W., with 16 or 17 feet on its shoalest part.

1. The N. E. end of the northernmost grove of trees on Plumb Island touching the south declining end of the southernmost of the white sand hills on Plumb Island. These sand hills are the two next south of the houses in the bay.

2. A large notch or gap in the wood on the main land, to the westward of Black Point, a sail's breadth open to the northward of a single black rock, which is between the south end of Great Gull Island and the N. E. end of Plumb Island, N. W. by N.

Thus appears the rock called Old Silas.

Marks for a bed of rocks, about 40 yards square, lying three-quarters of a mile off shore, on the S. E. side of Plumb Island. At low water the shoalest part has not more than three feet on them, and about the size of a small boat's bottom. It may be seen at low water; three fathoms all round, not more than 8 feet from the rock. Other parts of the reef, 8 fathoms are around the shoal.

1. The largest house with two chimneys, in the bay, east side of Plumb Island, in one with a large stone or rock on a hill behind the house, N. 33° W.

2. The Gull light-house touching the east end of Great Gull Island, N. 65° E.

3. The white sand hills on the south side of Fisher's Island, or Mount Prospect, half way open to the westward of Great Gull Island. S. E. part of Plumb Island, S. 74° W., and the N. E. end of same, N. 45° E.

Marks for a shoal in the middle of Plumb Gut, which is a compound of rocks and large stones, with only 16 feet on it, having 16 and 17 fathoms on the N. E. side, 20 on the N. W., and 6 and 7 on the south side. When on the shoal, took the following marks:

1. A small poplar tree in one with Mr. Jerome's door, N. N. E.

2. A single conspicuous tree in one with the east side of a grey cliff on Gardner's Island, S. E. by E.

3. Oyster Pond Point W. ½ N., and the S. E. (or Pine Point) of Plumb Island, E. by N., and the rocky point or bluff point of Plumb Island, north. The passage through Plumb Gut is to the northward of this rock.

There is another rock, with only 24 feet upon it, about 400 yards from the rocky or bluff point on Plumb Island, on the latter of which is a revolving light.

Marks for anchoring in Plumb Island Roads.

Mount Prospect, or the white sand hills of Fisher's Island, touching the Gull light-house, N. 62° E., and the N. E. part of Long Island in one with the S. E. end of Plumb Island, bearing W., or the east bluff points of Gardner's Island in one with the low beach which extends from the north side of the island, S. 45° E. With these marks you will have from 7 to 8 fathoms, soft mud, and quite out of the tide, and not more than three-quarters of a mile from the shore of Plumb Island, where there is very convenient and good water.

From Block Island a reef of rocks lies one mile distant from the north end of the island.

South-west Ledge lies W. S. W. from Block Island, 4 miles distant, having 4½ fathoms at low water, and breaks a heavy sea. As you open the passage between Montock and Block Island, you will deepen your water, and have soft bottom on an E. N. E. course, and when abreast of Block Island you will shoalen your water to sandy bottom; when past it, you will again deepen to soft bottom.

Bearings and distances of sundry places from the light-house on Montock Point.

The S. part of Block Island bears E. by N. from the light-house on Montock Point, 20 miles distant.

The eastern rips lie E. by N. 1¼ mile from the light-house. The northern rips lie N. E. ½ E. 3 miles from the light-house. These rips, although they may appear to the mariner dangerous, may be crossed with any draft, in 6, 7, 8, and 9 fathoms.

Shagawanock Reef, on which a spear is placed, bears N. W. ½ N. from the light-house on Montock Point, 3 miles distant; the reef ranges N. by E. and S. by W. about one-quarter of a mile in length. There is a good channel way between the reef and Long Island, about 1½ mile wide, in 3, 4, and 5 fathoms water.

Frisbie's Ledge is only a place of hard rocky bottom before you approach the light-house to the westward, from 8 to 15 fathoms, and no ways dangerous to any vessel. You may keep the shore on board from the Highlands (say three-quarters of a mile) and haul round Montock.

The east end of Fisher's Island bears N. ¾ W. from the light-house on Montock Point, 13½ miles.

Watch Hill Point light-house (which contains a repeating light) bears nearly N. from Montock Point light-house, distant 14 miles; there is a reef extending from Fisher's Island to Watch Hill Point, leaving a passage between the E. end of the reef and Watch Hill Point, half a mile.

The Race Rock, where there is an iron spear placed, bearing S. W. by W. three-quarters of a mile from the W. point of Fisher's Island, bears from Montock light-house, N. W. by N., 13¼ miles distant.

The Gull Islands bear S. W. by W. from the Race Rock, 4 miles distant. The light-house standing on the West Chop of New London Harbor, bears N. by W. ¼ W. 5 miles from the spear on the Race Rock. On the Little Gull Island there is a light-house containing a fixed light, bearing S. W. by W. from the west point of Fisher's Island, four miles distant.

Bartlett's Reef, on which a buoy and light vessel, with one mast and a bell, are placed, bears N. W. by W. ½ W., 4 miles distant from the Race Rock.

Little Goshen Reef, where a buoy is placed, bears N. E. ¾ E., about 2 miles distant from the buoy on Bartlett's Reef.

The light-house at New London Harbor, bears from the buoy on Little Goshen Reef, N. N. E. ½ E., about 1½ mile distant, and contains a fixed light.

The S. W. ledge, where a buoy is placed, bears N. by W. from the Race Rock, 4½ miles distant.

The East Chop of New London Harbor, bears N. by E. ¼ E. from the S. W. ledge, ¾ mile distant.

The light-house bears from the buoy on S. W. ledge N. W. by N. ¾ mile distant.

GARDNER'S ISLAND TO SHELTER ISLAND.—If you fall in with Gardner's Island, you must sail on the N. side of it till you come up with a low sandy point at the W. end, which puts off two miles from the Highland. You may bring the island to bear east, and anchor in 7 or 8 fathoms water, as soon as within the low sandy point.

GARDNER'S ISLAND TO * NEW LONDON.—Your course from the east end of Gardner's Island to New London is N. ½ E. about 4 leagues. In steering this course you will leave Plumb Island and Gull Islands on your larboard, and Fisher's Island on your starboard hand. In this pass, you will go through the Horse Race, where you will have a strong tide. This place breaks when there is any wind, especially when it blows against the tide. Your soundings will sometimes be 5 fathoms, at others 15 and 20.

In passing the west end of Fisher's Island, you must give it a berth of one mile, as there are several rocks to the westward of it; then your course to the light-house is N. by W., distant two leagues; but in going in here you must not make long hitches: you will leave a sunken ledge on your larboard, and one on your starboard hand. When within one mile of the light-house, you may stand on to the eastward, till the light bears N. N. W., and then run up about N. N. E. till abreast of the light, where you may safely anchor, or run N. for the town.

NEW LONDON.—If you are bound into New London, after getting to the northward of the S. W. part of Fisher's Island, keep New London light bearing from N. N. W. to N. N. E., if you are beating to windward, but if the wind is fair, bring the light to bear N. when at the distance of 2 leagues, and run directly for it; leave it on your larboard hand in running in; when in, you may have good anchoring in 4 or 5 fathoms water, clayey bottom. In coming out of New London, and bound west, when you have left the harbor, bring the light to bear N. N. E. and steer directly S. S. W. till you come into 15 fathoms water, in order to clear a reef that lies on your starboard hand, when the north part of Fisher's Island will bear E., distant 2 leagues.

NEW LONDON OR WESTWARD.—Keep Gull Island light to bear W. N. W. until you judge yourself within about two miles of the light; your course then to New London light (after you pass Race Rock, which lies W. S. W. from the point of Fisher's Island, distance ¾ of a mile) is N. ¾ W. In coming in, or going out of New London, (when opposite the Gull light) bring the Gull light to bear S. S. W. and New London light N. N. E., leave the light on your larboard hand in going into the harbor; keep well to the W. if it be winter season, and wind at N. E. and stormy—your course to break off a N. E. gale, in good anchorage, is W. N. W. from the Gull, distance 5 miles, then haul up, if the wind be N. E. and steer N. W. until you get into 10 fathoms of water, muddy bottom; anchor as soon as possible—you will be between Hatchett's Reef and Black Point; this is the best place you can ride in, if you have a N. E. gale, and thick weather, and cannot get into New London. † Saybrook light, will then bear W. by N. or W. N. W.

Saybrook is not a good harbor to enter, but if you must attempt it, bring the light-house to bear N. N. W. and steer for it until within one mile, then steer N. E. till the light bears N. W. by W., and then run for it until within half a mile distance, from which a N. N. W. course will carry a vessel up the river to good anchorage near the town.

When bound up Sound, and off Saybrook light in clear weather, give it a berth of three or four miles; your sound course then is W. S. W. ½ W., 50 miles distant, which will carry you up with Eaton's Neck light, leaving Stratford Shoal on the starboard hand. This shoal, which has a white spar buoy on the south, and black spar buoy on the north, between which you cannot go, bears north from Satatuket (Long Island) and S. 3° W. from Stratford Point light. The buoys are placed in 19 feet water. In leaving Falkner's Island light north two miles, steer W. (until you get into 5 or 7 fathoms water,) distance 20 miles to Stratford Point light, hard bottom, which leaves Stratford Shoal, that bears S. by W. from the light, on the larboard hand; then your course is W. S. W. to Matinicock Point.

FROM PLUMB GUT TO GREENPORT.—Vessels bound to Greenport may make their course S. W. and run 3 miles, which will carry you up to Ben's Point, on Long Beach. This beach is 3½ miles long, and covered with low cedar trees, which you leave on your starboard hand going up to Greenport. You will have, from Plumb Gut to Ben's Point, from 4 to 4½ fathoms water, and then your course is W. S. W. 3½ miles. In running this course you will shoal your water to 3 fathoms, and if you get any less water, haul to the southward, and as soon as you get 3 fathoms, keep your course, and run until you, by heaving your lead, from one heave will have from 3 to 7 fathoms water. As soon as you get 7 or 8 fathoms water, your course is W. N. W. one mile, which will

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* New London light-house stands at the entrance of the harbor, on the western side. The lantern is elevated 80 feet above the level of the sea, contains a fixed light, and bears N. by E. from Little Gull light, about 6½ miles.

† Saybrook Point light is a fixed light, at the mouth of the Connecticut river, on the west chop of the entrance to that river; it stands on a low sandy point, projecting into the sea, having on its west side a considerable tract of salt marsh, containing a pond of brackish water, which by its evaporation, creates a mist, at times, which very much impedes the light, the weather at the same time clear off shore. Height of the light-house from the sea 44 feet.

carry you to Hay Beach Point, on Shelter Island, which you leave on your larboard hand; haul close round Hay Beach Point, and your course is W. S. W. 1½ mile to Greenport; then you may come to anchor in a good harbor.

FROM GARDNER'S POINT TO GREENPORT the distance is 12 miles, and your course is W. by S. Running this course you will shoal your water from 6 fathoms, gradually, to 3 fathoms, on Long Beach side; and then you follow the above directions to Greenport. Five fathoms of water can be carried into Greenport, but large vessels should take a pilot—one is always to be had.

OYSTER POND POINT AND PLUMB ISLAND.—In sailing through this passage, (called Plumb Gut,) you leave the light on your larboard hand, running boldly for the cliff on which it stands, then steering S. E. by E. till the Gull Light bears N. E. by E., when you may shape your course for Point Judith, or wherever you may wish.

When passing the light, you will open Gardner's Bay, which is the passage to Sag Harbor, and also leave Oyster Pond Point on your starboard hand, off the eastern part of which a shoal extends one-third over toward the south end of Plumb Island.

The bearings of the light-house have been taken from the following places:—From Oyster Pond Point and the reef, N. E. by E., distant from the outer part of the reef 1¾ mile; from Saybrook light S. E. ½ S., distant 8¼ miles; from Pine Point (the S. W. part of Plumb Island) N. W. by N., distant three-quarters of a mile; from Cherry Harbor Point (the S. W. part of Gardner's Island) N. 30° W., distant 6 miles; from Gardner's Point N. W. ¾ W., distant 3½ miles; from New London light S. W. ½ S., distant 10 miles; from Cedar Island (at the entrance of Sag Harbor) N. N. E. ¼ E., distant 8 miles.

On Cedar Island is a fixed light; it is elevated 32 feet above high water, and as it may be seen from a high decked vessel, over the sandy point of Gardner's Island, vessels should not run for it when passing that point, until it bears S. of S. W.

The bearings and distances, by compass, of this light from the following places, are; Ram Head, S. ½ E., distant 2¼ miles; Plumb Island light-house, S. S. W. ¼ W., 8¼ miles; Gull Island light-house, S. W. ⅛ S., 12⅛ miles; sandy point of Gardner's Island, S. W. ¼ W., 8 miles.

If bound into New Haven, give Falkner's Island a berth of one mile, and steer W. by N. until * New Haven light is north of you, in 6½ fathoms water, when you may steer N. W., giving the light a berth of 1¼ mile, to avoid the S. W. Ledge, on which there is a black buoy, bearing from the light-house S. W. by S. ½ S., distant 1 mile, which you leave on your starboard hand, and when the light bears N. E. you may steer up N. E. by N. for the Fort, to the north of the Pallisades, leaving the white buoy on Adams' Falls on your starboard hand. When you are nearly abreast of the Fort give it a berth of one-fourth of a mile, and steer up N. ¾ W. for the end of the Long Wharf, leaving Black Ledge, which is one-fourth of a mile N. W. of the Fort, on your starboard hand.

The buoy on Adams' Falls bears from the light S. W. half a mile, and from the S. W. Ledge N. by E., half a mile.

There is a spindle on Quick's Rock, which bears from the light S. ¾ E., distant three-quarters of a mile. The buoy on Adams' Falls bears from the spindle N. W., distant half a mile. The buoy on S. W. Ledge bears from the spindle W. S. W., distant half a mile.

Vessels bound in from the eastward, may pass between the buoy on South-west Ledge and the spindle, as there are three fathoms water in this channel, keeping about midway between them, and leaving the white buoy on Adams' Falls 20 rods to the eastward of them, and then steer for the end of the wharf. On this shore, in channel-way, you will have 3, 4, and 5 fathoms water, muddy bottom. Bringing the light to bear S. E. you may anchor in Morris' Cove, near the east shore, in two fathoms water, muddy bottom. Your course from this up the harbor with a fair wind, is north. Give the Fort Rock, in running for the pier, a small berth.

Vessels bound in from the westward will leave both buoys on the starboard hand, and they may pass with safety within 20 rods of either of them. If beating in, your soundings will be from 2 to 3 and 4 fathoms. Stand in no further than 2 fathoms upon the west shore, on which you will have hard bottom. In beating up, after getting in muddy bottom, (which is channel soundings,) it is best to keep the lead a going often, on account of bordering on the west shore, where you will have hard bottom, and soon aground.

BRIDGEPORT.—Vessels bound into Bridgeport must leave the outer †buoy on the

* New Haven light-house is situated on Five Mile Point, at the entrance of the harbor, and lies on the starboard hand. The lantern is elevated 35 feet above the sea, and contains a fixed light. From New Haven light the following bearings and distances are taken, viz:—Stratford Point light S. 63° W., 10½ miles; Middle Ground S. 42° W., 14 miles; buoy on Adams' Falls S. 50° W.; buoy on S. W. Ledge S. 30° W.; beacon on Quick's Ledge S. 1° E.; Falkner's Island light S. 74° E., 12 miles.

† In the harbor of Bridgeport are three buoys, placed as follows, viz.: One on Marchand Flats, which lies a mile S. ½ W. from the outer beacon; one on Stony Bar, bearing S. E. from the beacon, 150 yards distant; one on Allen's Flats, being inside the harbor.

larboard hand, and steer direct for the beacon on Well's Point, which bears N. E. from the outer beacon that is on the west flat, about 350 yards distant, leaving the buoy on Stony Bar on the starboard hand, and Allen's Flats on the larboard.

FAIRWEATHER ISLAND, OFF BLACK ROCK HARBOR.—The harbor of Black Rock, although safe and easy of access, is so situated, that no direct course can be given to steer for the light, that will carry you direct into the harbor, as that depends wholly on the distance you are from the light, at the time you make for it; therefore, judgment is to be used in varying the bearing of the light as you draw near in, which is easily done by observing the following rules:—In coming from the westward, if you mean to harbor, to avoid the reef called the Cows, you bring the light to bear N. by W., and run directly for it, until within three-quarters or half a mile distant, when, if occasion requires, you may stretch in to the westward, in a fine beating channel, having from 5 to 3 fathoms water, and good ground. As you approach the light, which stands on the east side of the harbor, the water gradually shoals to about two fathoms. The mouth of the harbor, although not very wide, is not difficult; the light bearing east brings you completely into the harbor. The island on which the light-house stands, and the reef called the Cows, on the south and west sides, form the harbor of Black Rock. On the easternmost rock of this reef stands a spindle, distant from the light half a league, and from which the light bears north. The light stands 44 rods from the south point of said island at low water. From this point puts off a single rock, 30 rods distant, on which are 8 feet at high water, making in all about 74 rods distance. The light bears from this rock N. by E. ½ E. As soon as you pass this point or rock, the harbor is fairly opened to the northward, in any point from N. to W. N. W. You can run for the light with safety, observing, as you draw nearly in, the above directions, and due attention to the lead. The bottom for some distance from this rock, southerly, is hard, but you may continue your course, and it will soon deepen. It is safe and good anchorage to the eastward of the light for all winds from W. S. W. to N. N. E., quite down to the mouth of Bridgeport Harbor, which is distant about two miles. The shore on the eastern side of the light is bold to, in 3 fathoms, close aboard the light, and so continues until you are quite down to the south point of the island. This bay, to the leeward of the light, between that and Bridgeport, is one of the best bays for anchorage on the north shore in Long Island Sound, and affords from 4 to 3 fathoms water, the light bearing west. In coming from the eastward, crossing Stratford Point light close aboard, your course to Black Rock light is W. by N., and you keep sounding on the starboard hand, not less than 4 fathoms, nor more than 8 fathoms, to the north of Bridgeport Harbor, which is distant about two miles. The shore on the eastern side of the light is bold to, in 3 fathoms close aboard the light, and so continues until you are quite down to the south point of the island.

* LONG ISLAND.—Long Island, from Montock Point to Red Hook, extends W. by S. about 102 miles, and is at the broadest part about 25 miles across. The land is generally pretty low and level, excepting a few hills, which lie about 40 miles to the westward of Montock Point, and Hempstead Hill, which is 319 feet above the level of the sea. Along the south side of the island a flat extends about half a mile from the shore. The east end of the flat is sand; the middle and west parts are sand and stones. Your course, Montock Point light bearing north, 7 miles distant, along Long Island shore, is W. S. W., 22 leagues, and W. 12 leagues. About 4 leagues distant from the island there are from 15 to 18 fathoms water, and from that distance to 20 leagues, the water deepens to 80 fathoms; in the latter depth you will have oozy ground, and sand with blue specks on it. About four leagues off the east end of the island, you will have coarse sand and small stones; and at the same distance from the middle and west end, there is small white sand and gravel, with black specks. From the S. W. end, off Coney Island Point, a shoal extends about 6 miles towards Sandy Hook, which forms the east bank.

There are a few inlets on the south side of the island. The first one of any importance is Fire Island, on which bar there are 7 feet at low water. It is a dangerous bar, and only to be attempted by the aid of a pilot, who can be found on board of the coasters plying from the place. The remaining inlets are shallow, with the exception of Rockaway, to which bar the remarks on Fire Island above will apply.

BLOCK ISLAND TO NEW YORK.—Bound into New York, if you fall into Block Island Channel, you will have soundings in lat. 40° N., 100 fathoms, mud and ooze, which quality of soundings continue decreasing gradually, till you get into 40 fathoms. In 38 fathoms, Block Island bearing N. by W., 4½ leagues distant, you will have fine red and black sand; two and one-half leagues distant, same bearing, you will have 28 fathoms, coarse sand. When Block Island bears N., distant 4 or 5 leagues, you cannot

* Long Island Sound is a kind of inland sea, commencing at Sands' Point, where is a light-house, and extending to Gull Island light. It is from 3 to 17 miles broad, dividing it from Connecticut, and affords a safe and convenient inland navigation, having good anchoring places, and several fine light-houses to guide the mariner throughout its whole length.

see any land to the northward or eastward; but as you approach the island, you see Montock Point to the westward, making a long low point to the eastward, on which is a light-house. In sailing W. S. W., you will make no remarkable land on Long Island, from the eastward of said island to the westward, its broken land appearing at a distance like islands; but may discover Fire Island light-house, which shows a revolving light, containing 18 lamps, elevated 89 feet 3 inches above the level of the sea, and 70 feet 10 inches from the base, bearing N. 77° 35′ E, from Sandy Hook light, 12 leagues distant. From Fire Island light, a shoal extends south three-fourths of a mile, and joins the bar, which is very dangerous, as it shoals suddenly from 8 to 6 fathoms, then directly on the shoal, on which the flood tide sets very strong. It is not safe to approach the shore nearer than two miles when the light bears to the E. of N. To the eastward of the light the shore is bold; the bar is subject to change, and has 7 feet water on it. When Fire Island light bears N., in 10 fathoms water, you may steer W. by S., which will carry you up with Sandy Hook light. The quality of the bottom is various, viz.: yellow, red, brown, blue, and grey sand, within short distances. About south from Fire Island, 33 miles distant, and 40 miles S. E. by E. from the Highlands, lies a bank, extending from N. E. by E. to S. W. by W., having on it from 10 to 14 fathoms, pebbles. On the bank is plenty of fish. Within this, a short distance, you will get 20 fathoms, when it shoals into 16 fathoms, grey sand, which depth you will carry till you get into what is called the Mud Hole, where are from 20 to 36 fathoms water, marl or green ooze, and sometimes pebbles, the deepest part of which bears east from the northernmost part of the woodland, 10 miles; and S. E. ½ S., 15 miles from Sandy Hook light. From the Mud Hole to the bar of Sandy Hook the water shoals gradually, as laid down on the chart.

You will have 20 or 22 fathoms water out of sight of the land, sandy bottom in some, and clay in other places. Before you come in sight of Sandy Hook light-house, you see the Highlands of Neversink, which lie W. S. W. from Sandy Hook, and is the most remarkable land on that shore. On the Highlands two light-houses are erected.

NEW YORK.—If you fall in to the southward, and make Cape May, on which is a light-house exhibiting a revolving light, it would be prudent to keep about three leagues off, to avoid Herreford Bar, which lies from four to six leagues from the cape to the northward, and 8 miles from the inlet of that name. This inlet is frequented by the Delaware pilots, having no other harbor to the northward until they reach Egg Harbor. After passing Herreford Bar, you may steer N. E. when in 10 fathoms water, taking care that the flood tide, which sets very strong into the inlet, does not draw you too close; this course continued will carry you up with Egg Harbor; you will then have fine white and black sand, intermixed with small broken shells; by continuing the same course, you will deepen your water, and so continue till you draw near Barnegat Inlet. [In running along the shore, do not steer to the northward of N. E., if in 10 fathoms water or less, as you will be apt to get on Absecom Shoals, or Egg Harbor Bar.] On the south side of Barnegat Inlet, a light-house, containing a fixed light, is erected, off which you will get bright coarse yellow gravel. The shoal off Barnegat does not extend beyond two miles from the beach, and is steep to; you may turn this shoal in six fathoms water, within pistol shot of the outer breaker. It would always be prudent to keep in 9 or 10 fathoms water during the night, and not steer to the north of north-east, unless certain of being to the north of the shoal. The soundings are so much to be depended on, that the moment you lose the above soundings you are past the shoal, when you will have fine black and white sand, and very hard bottom; you may then haul in for the land N. by E., which course will bring you along shore in from 15 to 17 fathoms water, but if the wind and weather permit, I would recommend hauling in N. N. W., which will bring you in with the southernmost part of the Woodlands, which is very remarkable, having no other such land in the distance from Cape May up to the Highlands, and can be distinguished by its being very near the beach, and extending to Long Branch.

In passing from Barnegat to Sandy Hook, when to the southward of the lights on the Highlands, you must not open the northern light (which is a fixed light) to the westward of the southern light, (which shows a revolving light,) as that will bring you too near the Jersey shore.

Thus appears the south part of the WOODLANDS.

By passing Barnegat in the day time, it may easily be known: should you be so far off as not to see the breakers, you may perhaps see a grove of wood back in the country, apparently 3 or 4 miles long, known to the coasters by the name of Little Swamp, and lies directly in the rear of the inlet of Barnegat, so that, by sailing to the northward, your having the north end of this land directly abreast, you are certainly to the northward of Barnegat: there is also another grove directly in the rear of Egg Harbor, known by

the name of the Great Swamp, which has the same references as respects Egg Harbor; but that the one may not be taken for the other, it must be observed, the Great Swamp of Egg Harbor will appear much higher, and in length 8 or 10 miles; neither can they be seen at the same time, as Barnegat and Egg Harbor are 15 miles apart. Barnegat bears due S. by W., 41 miles from Sandy Hook. In hauling in for the Woodlands before mentioned, you may, if the wind is off the shore, keep within a cable's length of it all the way, until nearly up with the Highlands.

As a number of vessels have been lost, bound into New York, from heaving to with their head on shore, we cannot too strongly urge on the ship-master the necessity, *if he is in doubt of his position, of heaving to with the head off shore.*

The bottom on the New Jersey shore is of uncertain depth, not at all dependent on the distance, there being ridges parallel to the shore, with 7 and 8 fathoms, and 9 and 10 fathoms inside.

HIGHLANDS, N. 63° W.

LIGHT-SHIP.—A light-ship, of about 350 tons burthen, and showing two lights, is anchored off Sandy Hook, near the place of the old light-ship in 1827. The forward light is 30 feet above the deck, and the after one 40 feet. She is also provided with a bell of 800 pounds weight, which will be rung in thick weather. She is placed in 13 fathoms water. Sandy Hook light-house bears from the light-ship W. N. W., distant 13 miles. Highlands light-house, W. ½ N., distant 12 miles.

HIGHLANDS OF NEVERSINK.—Neversink Hills, on which two light-houses are built, extend N. W. and S. E., about S. W. from Sandy Hook, on the Atlantic Ocean, to Raritan Bay, and is frequently the first land discovered by mariners when they arrive on the coast. The correct altitudes of the following places, which present themselves to mariners as they approach them, are—

Mount Mitchell, the highest point of Neversink, Monmouth co., (N. J.,) 282 feet.
Tompkins' Hill, on Staten Island, ...307 do.
Hempstead Hill, Queen's county, Long Island,.....319 do.

HIGHLAND LIGHTS.—On the Highlands of Neversink there are two light-houses, bearing N. 23° W. and S. 23° E. from each other, distant 100 yards. The southern light is a revolving one, on the Fresnel plan, and is without doubt the best light on the coast of the United States. It is 248 feet above the level of the sea. The northern light is a fixed light, 246 feet 7 inches above the sea.

SANDY HOOK LIGHT is on the northern point of Sandy Hook, and is a fixed light, 90 feet above the level of the sea.

Two beacons are erected on the Hook; the easternmost one ranges for the buoy of the Upper Middle, and the westernmost one ranges for the buoy of the S. W. spit; they are both lit at night.

S. ¼ E. from Sandy Hook light, 5 miles distant, is a ledge about one mile from the shore, with not less than 2½ fathoms on it, and on which the ship William Thompson struck.

OIL SPOT.—E. S. E., 2¼ miles from Sandy Hook light, is the Oil Spot, having only 10 feet water in one spot, at low water; it is of a triangular shape, and about half a mile on each side in extent; the Along-shore Channel is inside of it.

FALSE HOOK.—One and a quarter mile E., a little northerly, from Sandy Hook light, there is a small shoal spot, with only 12 feet water upon it at low water; it is the remains of the old False Hook.

NEW YORK HARBOR.—There are three channels over New York Bar; the first is that along and parallel to the Jersey shore, inside of the Outer Middle; the second is the main ship channel between the buoys of the bar; the third is a slue of deep water, to the northward of the black buoy of the bar, over which you can carry 24 feet at low water; this channel runs in nearly W. by S.; it was first discovered by Lieut. Gedney, of the U. S. Coast Survey, and is used by our largest class ships of war.

ALONG-SHORE CHANNEL.—If bound into New York from the southward, and close in with the Jersey shore, and you do not draw over 10 feet water, you may continue on until you get Sandy Hook light to bear W., or W. by N., when you may steer N. by E., to avoid the point of the False Hook, until you get into deep water, say 7 fathoms, Sandy Hook light bearing S. W., then steer W. N. W. until the light bears S. by E., then, with a flood tide, steer N., or with an ebb steer N. N. W., (the true course is N. by W.,) which will carry you over the East Bank, and up to the black buoy of the Middle.

In going over the East Bank, be careful you do not get set by the ebb tide on Romer; the mark to keep clear of Romer is, to keep Sandy Hook light open with the east end of the Highlands.

There is another passage over the east bank between Romer and Long Island. This passage has been buoyed off, and the following are the directions:

The buoys to mark out this channel to the northward and eastward of Romer, are ten in number, and with the following distinguishing marks. Those on the larboard hand coming in, are black and white, in horizontal stripes; those on the starboard hand, red and black.

The first buoy	on the	larboard	hand	coming	in,	is	in 25	feet	water.
The second buoy			"	"	"	"	" 19	"	"
" third	"	"	"	"	"	"	" 24	"	"
" fourth	"	"	"	"	"	"	" 24	"	"
" fifth	"	"	"	"	"	"	" 24	"	"
The first buoy	on the	starboard	hand	coming	in,	is	in 19	feet	water.
The second buoy			"	"	"	"	" 19	"	"
" third	"	"	"	"	"	"	" 24	"	"
" fourth	"	"	"	"	"	"	" 24	"	"
" fifth	"	"	"	"	"	"	" 24	"	"

The above named buoys are placed in the shoalest water in the channel, and on the edge of the banks which form the channel; and in no one case must a vessel stretch beyond the buoys on either side.

There is a true tide setting through the channel, the time of high warer the same as at the Hook, viz. full and change 7h. 35 min.

The course in, after entering the channel, is W. N. W. by compass, until the Hook and Highland lights are in range. Keep these in range, and run up for the Narrows, which will carry you clear of every thing.

To the northward of the black buoy of the Bar, the following spar buoys have been placed. Those on the larboard hand coming in, are black, with white tops; and those on the starboard hand, white, with black tops.

The 1st buoy	on the	larboard	hand	is	in 31	feet	water.
2d "	"	"	"	"	24	"	"
1st "	"	starboard	"	"	30	"	"
2d "	"	"	"	"	24	"	"

The flood tide sets, first half, N. W., last half S. W. All the above depths are at low water.

The spar buoys at the entrance will be changed in the spring, and can buoys, with the same marks will be put down.

SANDY HOOK CHANNEL-WAY.—In running into New York, if intending to go ship-channel-way, give the Jersey shore a berth of 3 miles, until the light on Sandy Hook bears W., which will bring you midway between the buoys of the bar; then steer in for the point of the Hook, keeping the light-house well open on the larboard bow, (taking care, if it is flood, not to be set too far to the northward, and if ebb, to the southward,) when abreast of the Hook, so that the light-house and east beacon range; keep within half a mile of the shore, to avoid Flynn's Knoll, which has on it only 7 feet water, and lies N. by W. 1½ mile from the light, and seven-eighths of a mile from the point of the Hook. After you have passed the beacon, if you mean to anchor, you may haul into the bay, S. W., giving the Hook a berth of a mile, until you bring the light-house to bear E. by N., or E. N. E., where you may anchor in from 5 to 7 fathoms water, soft muddy bottom. But, should you wish to proceed to New York, when you have come in as before directed, and got abreast of the beacon, or the point of Sandy Hook, steer up W. by N. until you get the light-house on Sandy Hook to bear S. E., when the light and west beacon will be in range; keep them in range, and run directly for the black buoy of the S. W. Spit, which you leave on the starboard hand, giving it a berth of 200 yards.

After you have passed the buoy of the S. W. Spit, steer N. by E. ¼ E. for the black buoy of the Upper Middle, which is 2¾ miles distant from the S. W. Spit buoy: on this course you will leave the white buoy of the Knoll on your larboard hand; after you get up with the black buoy of the Upper Middle, steer N. by E. until you pass the white buoy of the West Bank, when you open two hummocks in New Jersey; the westernmost one is called Snake Hill; keep this hummock open with the bluff of Staten Island, and steer N. by W., which course will carry you through the Narrows. Between the can buoy of the West Bank and the bluff of Staten Island, are 4 white spar buoys,* which you leave on your larboard hand. When thus far, you must, to pass Fort Diamond, keep Staten Island shore aboard. The mark to pass Fort Diamond is to keep Bedlow's Island open with the point of Long Island; for if you can see Bedlow's Island in coming through the Narrows, there is no danger from the Narrows to come up to New York; you will

* The spar buoys are not always put down, but the can buoys are, except in the winter season, when they are substituted by spar buoys, which are put in the same spot.

steer up for Bedlow's Island to avoid the Mud Flat, on which four black buoys are placed, which you leave on your starboard hand. This Flat is a kind of oyster bed, or bank of mud and shells, and has not more than 11 feet on it at low water; but to avoid this flat do not stand too far to the westward, on account of Robbin's Reef, on which there is a light-house, between which and Bedlow's Island are three white spar buoys, which, to avoid running on the west side of the channel, the mark is to keep the point of land up the North River (on which Fort Lee stands) open with the east side of Bedlow's Island, after which there is nothing material to obstruct the navigation to New York, it being very steep near the point of Governor's Island, and the rocks near the Battery do not extend 100 yards from the shore. There are three reefs of rocks in the East River, viz. one off the north side of Governor's Island, with 15 feet water on it; one off the Battery, having 9 feet over it, and one off Corlaer's Hook, which is very dangerous; they may generally be distinguished at all times by the rip of tide going over them, both flood and ebb.

These directions are for slack water; those following them should remember that the flood tide below the Narrows sets to the westward, and the ebb to the eastward.

Between the buoy of the West Bank and Staten Island there is a shoal, dry at low water; the mark to avoid this, is to keep Snake Hill open with the bluff of Staten Island.

Other Directions.—Or you may, after making the Highlands of Neversink, run in boldly within three miles of the beach, and in steering along to the northward, observe to keep in about 8 fathoms water, until you get the light-house to bear W. $\frac{1}{3}$ N., then if you have a round hill, called Mount Pleasant, some distance in Jersey, in one view with the land about one-quarter of a mile to the southward of the light-house, you are in a situation to pass the bar; steer in W. by N. until you are over it: you will have on it at low water, 3 fathoms; when over, you will be in $4\frac{1}{2}$ fathoms. Pass the Hook and light-house about half a mile, at which distance you will have 5 and 6 fathoms. When you have the point of the Hook on which the beacon stands bearing S. S. E. you may then haul to the southward, and round the Hook and come to, from one to two miles distant, the Hook bearing from E. to N. E., in good holding ground, 5 fathoms water. When you make Long Island, it is necessary to keep somewhat in the offing, on account of the East Bank, and observe the same marks running in as before mentioned.

If sailing up in the night, when abreast of the S. W. Spit, the two lights on the Highlands will range, when you may steer N. by E. $\frac{1}{4}$ E. until you make the buoy of the Upper Middle, when the East Beacon and Sandy Hook light will range in one. After passing the Upper Middle, you will deepen your water to 6 fathoms, when you may steer N. up through the Narrows, and you will deepen your water to 7, 8, 10, 12, and 16 fathoms.

High water at full and change of moon on the Bar and Sandy Hook, $7\frac{1}{2}$ A. M.

Average rise and fall of tide on the Bar, $5\frac{1}{2}$ feet,

Set of tide on the Bar, and between the Hook and Romer,			first	quarter	flood,	from	2 A. M.	to	$3\frac{1}{2}$ A. M.	S.W.
Do.	do.	do.	second	do.	do.	from	$3\frac{1}{2}$ A. M.	to	5 A. M.	W.
Do.	do.	do.	third	do.	do.	from	5 A. M.	to	$6\frac{1}{2}$ A. M.	N.W.
Do.	do.	do.	last	do.	do.	from	$6\frac{1}{2}$ A. M.	to	8 A. M.	N.
Do.	do.	do.	first	do.	ebb,	from	8 A. M.	to	$9\frac{1}{2}$ A. M.	N. E.
Do.	do.	do.	second	do.	do.	from	$9\frac{1}{2}$ A. M.	to	11 A. M.	E.
Do.	do.	do.	third	do.	do.	from	11 A. M.	to	$12\frac{1}{2}$ P. M.	S. E.
Do.	do.	do.	last	do.	do.	from	$12\frac{1}{2}$ A. M.	to	2 P. M.	S.

In the spring of the year, when freshets run, the half flood runs to the S. W. and W. W. S.

N. B. The above answers for the Upper Middle and Buoy of West Bank, with the exception of one half hour later.

Bearings from the Telegraph at Neversink Hills.

Sandy Hook light-house N. 7° W., with the west side of Fort Lafayette in range. Telegraph on Staten Island N. 10° W. Level of the hill at the Telegraph where the light-houses are erected, 205 feet, making the two lanterns 250 feet above the level of the sea.

Bearings from Prince's Bay light-house.

Point of the Neversink Hills, S. 54° E.

Sandy Hook light-house, S. 71° E., distant 10 miles.

Spar Buoy, on the north side of the Round or Middle Shoal, at the entrance of Prince's Bay, S. 86° E.

At Prince's Bay, where the light-house is erected, the level of the hill is 77 feet above tide-water. The elevation is 30 feet from its base.

Directions for sailing in by Sandy Hook, corresponding with the Chart published by E. & G. W. Blunt.

In coming up with the bar, when midway between the buoys, steer W. by N. till the light on Sandy Hook ranges with the easternmost of five trees on the Highlands; you

may then steer W. till you get the west Beacon on the point and the light-house in range, and so keep them till you make the black buoy of the S. W. Spit: after hauling round the spit, steer N. by E. $\frac{1}{4}$ E. until you make the buoy of the Upper Middle, but be careful of the flood tide, which sets directly over to the West Bank; after you have passed the buoy of the West Bank (which is the upper buoy) you should not bring Staten Island light north of N. by W., as the edge of this bank is very shoal, and extends to the point of the island.

If you wish to run for Prince's Bay, bring the * light to bear W. N. W. and run for it, anchoring as near the shore as you please; E. S. E. $\frac{1}{2}$ S. from the light will take you on the N. point of the shoal, on which a buoy is placed; this buoy is left on the larboard hand in going in, but as it is liable to be carried away by the ice, the light should never be brought to bear north of W. N. W.

The following are the bearings, courses, and distances, of the buoys placed in the Harbor of New York.

CAN BUOYS.—The black buoy on the bar, bearing E. by N. from the light-house, distant $3\frac{1}{2}$ miles, ranges with the light-house, and Mount Pleasant, in New Jersey.

The white buoy on the bar, bearing E. $\frac{1}{2}$ S. from the light-house, $1\frac{3}{4}$ mile distant, and S. from the black buoy, $1\frac{1}{4}$ mile distant; between these buoys is the channel. This buoy ranges with the West Beacon and Block House.

The black buoy on S. W. Spit, $2\frac{3}{4}$ miles from the light-house, bearing N. W. by W., ranges with the West Beacon and light-house.

The white buoy on the Knoll, bearing N.W. $\frac{1}{2}$ N. from the light-house, distant 4 miles and one-tenth.

The black buoy of the Middle, distant 5 miles from the light-house, bearing N. 15° W., ranges with the East Beacon and light-house.

The white buoy of the West Bank, N. 15° W. from the light-house, $6\frac{3}{4}$ miles distant, ranges with Snake Hill, in New Jersey, and the bluff of Staten Island, where the light-house is erected, as before mentioned, and where the telegraph now stands.

SPAR BUOYS,

Between the Ocean and the City of New York, in conformity to Act of Congress.

Five spar buoys between the outer bar and the black can buoy of the spit.

Four black spar buoys between the can buoy of the spit and the can buoy of the Middle.

Three black spar buoys between the can buoy of the Middle and Coney Island.

Four black spar buoys on the shoal opposite Gowanus Bay.

On the S. E. part of the ruins of Flinn's Knoll, in 3 fathoms water, is a black spar buoy, bearing N. from Sandy Hook light-house.

Vessels from sea, going up Ship Channel, must leave it on the starboard hand, and those bound through the Swash Channel on the larboard hand.

On the west side of the Main Channel.

One black spar buoy on the north side of the Round, or Middle Shoal, opposite Prince's Bay.

Four white spar buoys between the white can buoy of the bar and the point of Sandy Hook.

Six white spar buoys between the can buoy of the Knoll and the can buoy of the West Bank.

Four white spar buoys between the can buoy of the West Bank and Staten Island.

Three white spar buoys between the point of Robbin's Reef and Bedlow's Island.

In the East River and Long Island Sound.

One white spar buoy on the Middle Ground, opposite Bushwick Creek, where the Dry Dock is located.

One black spar buoy on the Governor's Table, Blackwell's Island.

One black spar buoy on Lawrence's Reef, south from Westchester Creek, near Long Island.

[NOTE.—In sailing Ship Channel, the white buoys are to be left on the larboard, and the black buoys on the starboard hand. None of the buoys are in less than 19 feet water.]

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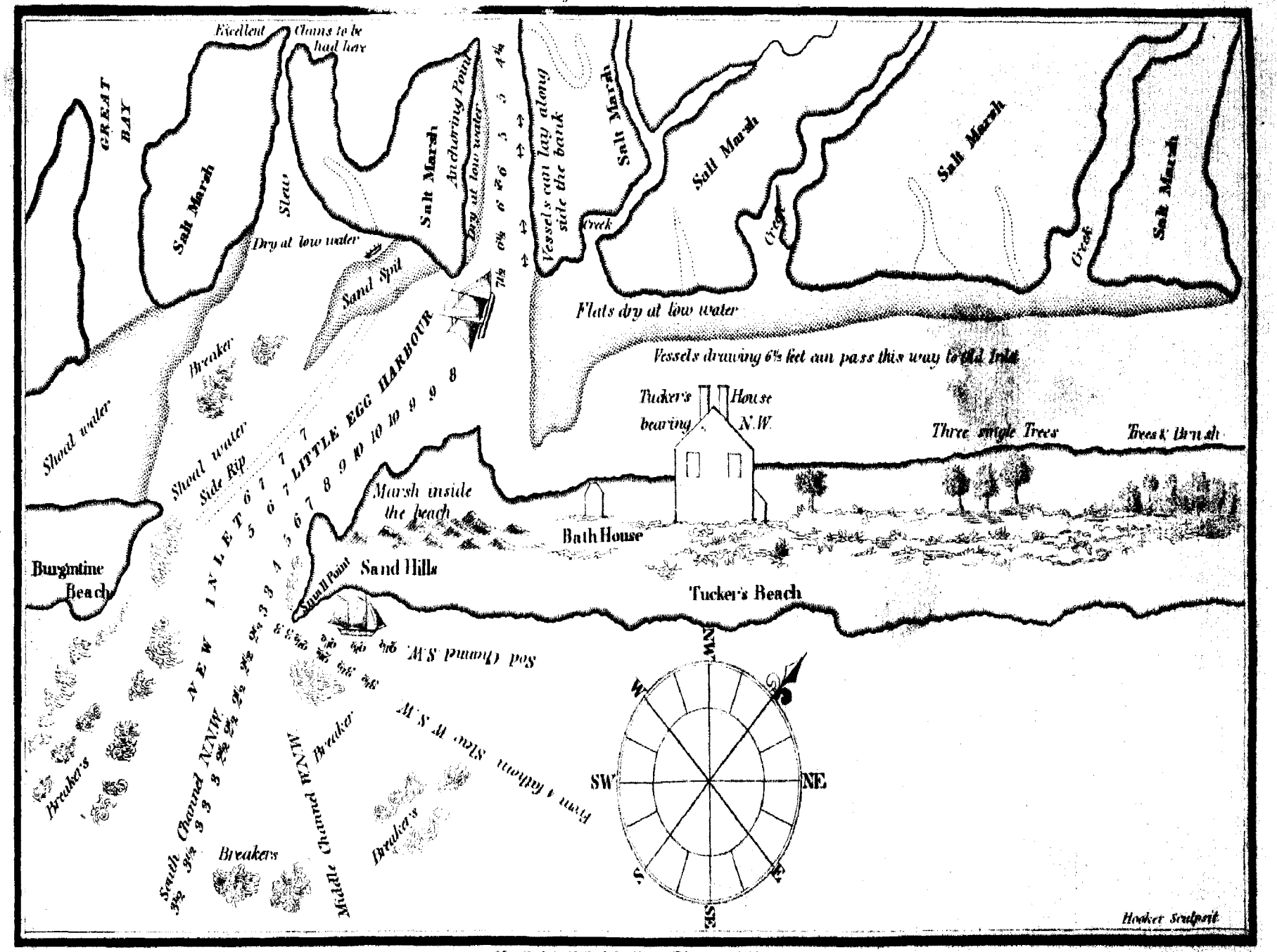
* Prince's Bay light-house stands on a bluff on the west side of the bay, bearing N. 71° W. from Sandy Hook light, distant 10 miles, and W. from the Knoll Buoy. It shows a fixed light, facing E. S. E., having eleven lamps, elevated 106 feet 11 inches above the level of the sea, and 29 feet 11 inches from its base.

Engraved for Blunt's Coast Pilot 14th Edn



New York Published by E & G.W. Blunt 1841

NOTICE.—Harbor Master's Office, for the port of New York, is kept at the Nautical Store of EDMUND & GEORGE W. BLUNT, 179 Water street, corner of Burling Slip.

COAST SOUTHWARD OF SANDY HOOK.—If you come in near Cape Hatteras, be careful of its shoals, and make your way to the N. N. E., which will carry you on the soundings of the Jersey shore. When you get 20 fathoms water, in lat. 40° N., then haul in to make the land, by which you will avoid the difficulties of the coast, and the shoals nearer in shore; but if you cannot, see the following:

When you are up with Chincoteague Shoals,* in 16 fathoms water, it is near enough to approach them; from this station, if bound into the Delaware, steer N. N. E. ¾ E., which is the course parallel to the land, until Cape Henlopen light bears W. You may then run in for it; or, if bound to New York, keep on that course until you have passed the pitch of Long Beach, taking care, as remarked before, not to run into less than 10 fathoms water, if night. You then can steer for the Hook. If, in running up, you deepen your water suddenly, from 14, 18, to 25, and 30, or 35 fathoms, oozy bottom, you are in what is called the Mud Hole, the centre of which is 13 miles from the tavern, at Long Branch, and S. E., 15 miles, from Sandy Hook light-house.

SANDY HOOK, CAPE MAY, AND CAPE HENLOPEN LIGHT-HOUSES.—When sailing from Sandy Hook light-house, as soon as to the eastward of the bar, steer south, if night, till you pass Barnegat; if day-time when passing, you may go nigh the breaker, say 5½ fathoms. In sailing between the Highlands and Barnegat in the day-time, you may go within one-quarter of a mile of the land, if the wind is off shore. When you have passed Barnegat, steer S. W. by S., 10 or 11 leagues, which will carry you up with Great Egg Harbor, which has a shoal bank one league from the shore, that has not more than 6 feet water on it.

In the day time you may go within 2 leagues of the shore, but in the night it will be prudent to keep further off. When you have passed Great Egg Harbor, steer S. W. by W. 10 leagues, which will bring you up with Cape May light.

Between Barnegat and Cape May there are three inlets, one of which is fit, at high water, for vessels drawing 15 feet, viz., Little Egg Harbor, off which buoys are placed. Great Egg Harbor may be run for in time of danger, and will give 12 feet at high water. The navigation is not so safe as other places.

In running for Cape May, while steering your S. W. by W. course, you will pass five inlets before you come up with Cape May light, viz., Coston's, Townsend's, Herreford, Turtle Gut, and Cold Spring, all of which have bars lying off their entrances; when abreast of Herreford inlet, you may, if bound to Cape May, steer W. by S., but if bound to Cape Henlopen, steer S. S. W. till the light-house bears W., when you may run for it till within 2 miles.

E. ½ S. from Cape May light, 15 or 18 miles distant, lies Five Fathom Bank, with not more than 12 feet water on it. The south point bears E. ½ S. from Cape May, and from Cape Henlopen it bears E. by N., 30 to 32 miles distant, and ranges N. N. E. and S. S. W. It is dangerous for large vessels.

LITTLE EGG HARBOR.—During the winter season it frequently occurs that vessels are prevented entering the Delaware or Sandy Hook by violent north-west winds, and often driven off the coast into the gulf. To remedy, so far as possible, this inconvenience, the author inserts the directions, which will enable them to make a safe harbor, viz.:

Running through the Sod Channel, keep within 30 or 40 yards of Small Point, and you will have 2½ fathoms; pass the point, then gradually haul round, giving the breakers a small berth; or steer in for the beach, when you are opposite Tucker's house, until you are in 4 fathoms, then steer W. S. W., which course will carry you through the same channel.

The following described buoys are placed at the entrance of Little Egg Harbor:

One spar buoy in the middle of the Sod Channel, a little outside the bar or breakers.

One spar buoy in the same channel at the Point of Sods, upon the north side of the main channel. The buoy at the point of Sods upon the north side of the main channel, bearing S. W. from the buoy on the bar, both lying in 2½ fathoms.

One spar buoy upon the point of Hugh's Bar, on the west side of the main (or east) channel, bearing from the buoy on the Point of Sods W. N. W.

One buoy at the middle of the east (or main) channel, a little outside the bar, (or breakers,) in 2½ fathoms water.

One spar buoy at the point of the round shoal in 2½ fathoms water, upon the north side of the east channel, bearing from the outward buoy in the east channel, W. S. W.

ABSECUM INLET.—Absecum lies 5½ miles S. W. from Little Egg Harbor. Off Absecum, from E. to E. by S., 3 miles, lies a shoal, having on it several lumps, on which

* A light-house, containing a fixed light, is erected on the S. E. point of Assateague Island, to point out the proximity of Chincoteague Shoals.

there are only 10 feet water; the ground is broken, having between the lumps 4 and 5 fathoms. On this shoal the ship Citizen was lost in 1822.

To enter the Harbor.—Bring the house which is on the starboard hand point to bear N. W., and steer directly for it, until within one-fourth of a mile from the house, when you must steer north till you get to the marsh, where you may anchor in from 3 to 6 fathoms; depth of water on the bar at low water 9 feet, common rise of the tide 5 feet.

*CAPE MAY LIGHT.—Vessels approaching the Delaware by Cape May, will get the light to bear W. N. W. in 4 or 5 fathoms, then run for it, and make a safe entrance into the Delaware, clear of all shoals, with vessels drawing 12 or 13 feet water.

Running for the light, keep about two miles to the northward and eastward of it, till about three-quarters of a mile from the shore, where is a windmill and several houses, occupied by † pilots principally. From this you must keep the shore close on board, when you will be in 5 fathoms water, till you double round the Cape, when you will leave the Great Shoal on your larboard hand, over which it continually breaks, when covered, bearing S. E. by E. from the light, distant 1½ mile, bare at low water. After you have doubled the Cape, steer N. till the light bears S. E. ½ S., when you must steer N. W. till you deepen into 7 and 8 fathoms. In running the above course, you will have from 5 to 2½ fathoms, before you come into 8 fathoms, which is three leagues distant from the light. After you have got into 8 fathoms, you will immediately come into 3 fathoms, when you must steer N. W. by W. 5 leagues, which will carry you into the main channel, between the Brandywine light-house ‡ on your larboard, and Cross Ledge on your starboard hand, bearing N. N. W. and S. S. E. from each other, distant 3 leagues. The light-house on the Brandywine is 1½ mile upon the shoal, above the S. E. point of it. The outer extreme of the Brown and Brandywine shoals is about 3 miles.

Cross Ledge has a beacon boat with one mast, moored on it in summer; and in winter a buoy.

On the first of the flood, the tide sets to the westward, and in light winds should be guarded against, by steering from one to two points more to the eastward, and on the ebb the contrary; this course will keep you from the shears about 1½ mile.

In running the above course, you will have 3, 3½, and 2¾ fathoms, till you come near the main channel, when you will deepen into 5 fathoms, which is a swash that runs up to the eastward of the Cross Ledge; still keep your N. W. by W. course till you have crossed this swash, when you will shoal your soundings into 2½ fathoms, and then deepen into 7 fathoms, which is the main ship channel, when you must steer N. W. till you have only 5 fathoms, which is on the Fourteen Feet Bank, (which has a buoy on the S. S. E. end) and then alter your course to N. N. W. for Cross Ledge. One league distant from this ledge lies a shoal, called Joe Flogger, bearing W. S. W. from the buoy.

CAPE § HENLOPEN ‖ LIGHTS.—Bring Cape Henlopen light to bear W., and run for it till within two miles; when abreast of it, you will have 15 or 16 fathoms water. After you have passed it, steer W. S. W. till you bring it to bear E. S. E., where you may anchor, in 3 or 4 fathoms.

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* Cape May light-house is on the extreme south-west point of the Cape, at the entrance of Delaware Bay: its elevation from the sea, is about 80 feet; contains a revolving light, and makes a revolution in three minutes. It bears N. E. by N. from Cape Henlopen light, distant about 12¼ miles. Brandywine light-house bears N. W. by W. ½ W., distant about 9¼ miles.

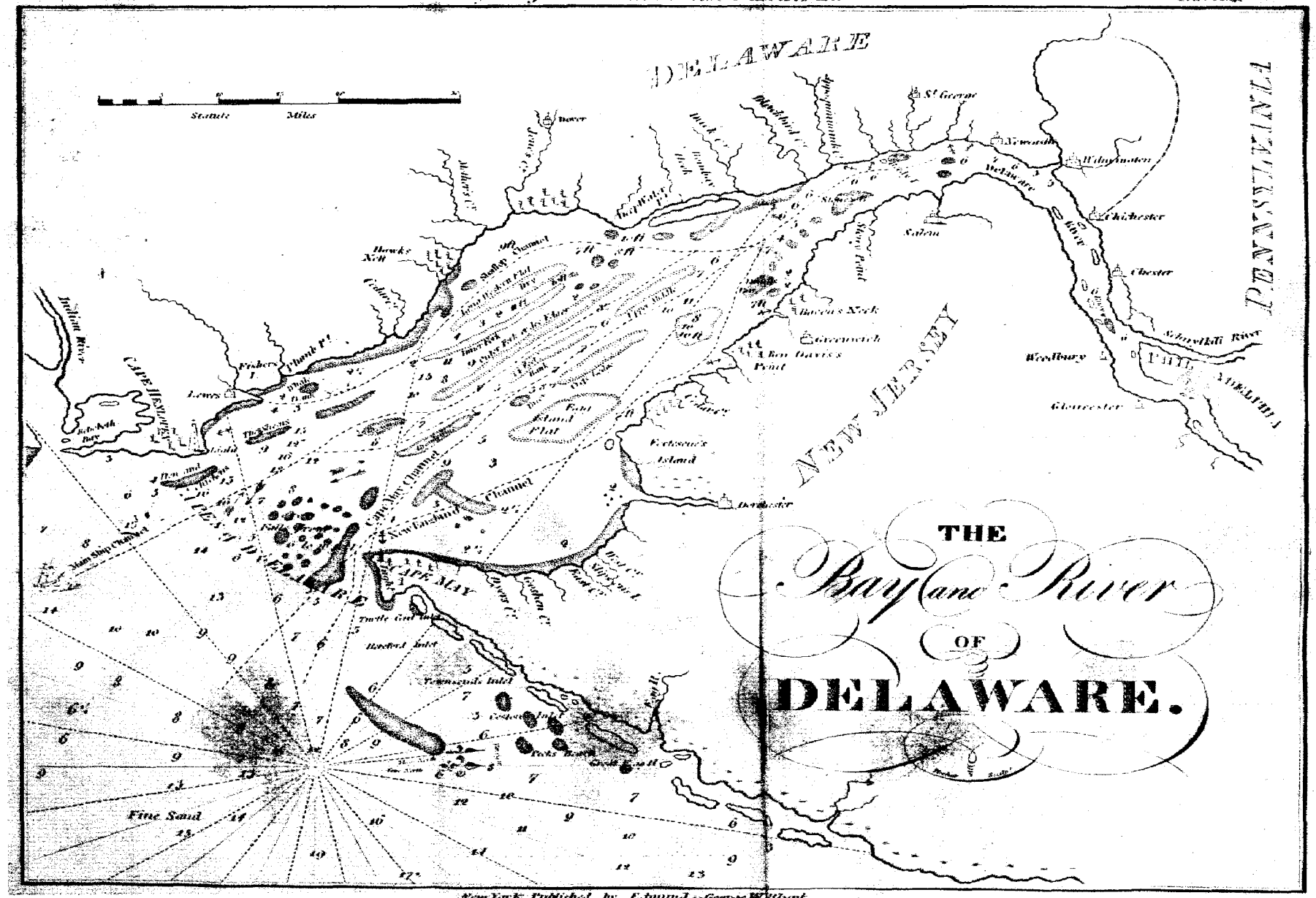
There is good anchorage and harbor under Cape May light, with the wind at N. or N. N. E., and after passing the light and keeping the land on board in 3 to 5 fathoms water, vessels will find safe anchorage, and a good harbor, with the wind at the eastward.

† As soon as in sight of the light, and in want of a pilot, you had better hoist some signal, as those who do not, are considered not in want of one.

‡ The light-house on the Brandywine Shoal is entirely destroyed.—The Light Boat is anchored on the west side of the shoal, bearing from Cape Henlopen N. by W., distant 12 miles, and from Cape May W. N. W.; it shows two lights on separate masts: it is only anchored there from the 10th of March to the 10th of September.

§ Cape Henlopen lies in lat. 38° 47′ N. and in long. 75° 05′ W. There is a light-house here, a few miles below the town of Lewis, of an octagon form, handsomely built of stone, 115 feet high, and its foundation nearly as much above the level of the sea, containing a fixed light. East of this light-house, is the Hen and Chickens Shoal, after described. The nearest part of the Overfalls, which has on it from 2 to 5 fathoms, bears N. E. by N. from the land, distant 4½ miles; the outer point N. E. by E. ½ E., distant 5 miles. When the main light-house bears about S. ½ W., distant 3¼ miles, then the light-house on the Brandywine Shoal bears N. ½ W., distant 11½ miles. This course will take you three-quarters of a mile to the S. E. of the buoy of the Brown.

‖ NOTICE TO MARINERS.—A Beacon light-house has been erected, and is now lighted with a brilliant fixed light, that can be seen six leagues. It stands on the extreme north end of Cape Henlopen, very near the beach. It bears N. 5° W. three-fourths of a mile from the old light-house. Ships running in for Old Kiln Roads, may, when the beacon light and the light-house are in one, approach the beacon light within a cable's length; then steer W. N. W. until the old light-house bears S. E., and anchor in 4 fathoms, good holding ground.



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1841

E. ½ S. from Cape Henlopen, 25 miles, is a shoal, with 4 fathoms on it, gray sand.

Entering Lewistown Roads, you will observe the depth of water, at low tide, on the piers deposited at the Breakwater, is reduced to 12 feet, and that in order to mark the situation of these piers, and to render secure the approach of all vessels to the roads off Lewistown, twelve spars buoys have been anchored round the piers; and two signal lights, fixed on the shore abreast of the piers, will be kept burning all night during the winter season.

On approaching Lewistown Roads, when you have the signal lights on the shore abreast of the piers in range, avoid bringing the beacon light on the pitch of Cape Henlopen to bear S. E. ½ E.; for at this bearing, and the two signal lights in one, you will be in danger of the sunken piers.

There are now two hundred yards of the Breakwater five feet above high water, and a continuance of four hundred yards at the south part a wash at common high tide, making a range of protection in length, six hundred yards. At the Ice Breaker, about sixty yards are above high water, and two hundred and fifty yards at the east part, a wash at common high tide, making a protection of three hundred and ten yards. There is no difficulty with common attention, in running into the anchorage to the southward of the Breakwater, even in a gale of wind, either between the two works, or by the passage to the S. E. of both. There is a signal light kept on the N. W. end of the Breakwater.

In approaching from sea and going in by the south passage, give the beacon light on the pitch of the Cape a berth of from four to five hundred yards, and when you bring the west end of the Breakwater to bear N. W., steer for it, and anchor in a line between it and the Government house on the beach, as close on the works as you can with safety, the light on the west end bearing about N., or N. by W.

FIVE FATHOM BANK.—Vessels bound into the Delaware, coming from the northward, or having fallen to the northward of Cape Henlopen, should be careful not to approach nearer than 12 fathoms water, until they have got into the latitude of said Cape, to avoid the shoal called the Five Fathom Bank; on which a light-vessel, having two masts, with a lantern on each, is moored in 7¼ fathoms water, Cape May light-house bearing W. 20° 30′ N., distant 15¼ miles; the centre of the shoalest ground, on which is found 12 feet water, bears N. 28° E. from the light-ship, distant 2¾ miles. It extends N. by E. ½ E., and S. by W. ½ W., three-fourths of a mile, and is half a mile in breadth, and very bold on its eastern edge, as there are 12 fathoms half a mile to the eastward of the shoal water.

Vessels coming from the northward should not run for the light-ship, while bearing from it between N. 14° E., and N. 41° E. S. E., three-fourths of a mile from the light-ship, there are 5 fathoms water.

There is a passage inside of this shoal, by taking your soundings from the land, in 6 or 7 fathoms, but strangers in large vessels should not attempt it.

In running up the bay, keep the old light-house to bear S. ½ E., until you pass the beacon boat, with one mast, on the Brown, distant 9 miles; then steer N. by W. for the light-boat near the Brandywine Shoal, until you come within half a mile, then steer N. N. W. for the upper part of the Brandywine, on which there is a beacon boat with two masts; then steer N. W. by N. for the lower part of the Fourteen Feet Bank, on which there is a small buoy. When in 5 fathoms water, steer more northerly, until you deepen your water into 6 and 6½ fathoms; then steer a point more westerly, until you shoal again to 5 fathoms on said bank. By keeping off and on this bank you will be certain you are on the western side of the channel, until you come up abreast of the Cross Ledge, which is on the eastern side of the channel, and has on it a beacon boat, with one mast, in summer; and in winter a buoy. The channel here is very narrow, not more than 1¼ mile wide. You will then be nearly up to the upper end of the Fourteen Feet Bank, where there is placed, from March to December, a floating light-vessel, with one light, which you leave on your larboard hand. From thence to Upper Middle, (near which is also a light-vessel,) is four miles, on which there is a buoy; it has 3 or 3½ fathoms at low water on it. You may go to the westward of the Middle in 4 or 4½ fathoms, soft bottom; to the eastward there are 6 or 7 fathoms, hard bottom. This is the main ship channel. The course from the Middle to * Bombay Hook Bar is N. W., twelve

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* The following light-houses are erected in Delaware Bay:

One at Mispillion Point, which is on a dwelling house, and is only used for vessels bound into Mispillion Creek, and drawing less than 6 feet of water.

One at Mahon's Ditch. Mahon's Ditch is south of Bombay Hook Island; and this light is also on a dwelling house, and is useful to vessels drawing 10 feet, or less.

One on the northern point of Bombay Hook Island, which is likewise on a dwelling house, 36 feet above the sea.

And one on the northern side of the bay, at Cohancy Point. This light is on the larboard side, at the entrance of Cohancy Creek.

There is also a light-house on the starboard side, at the entrance of Christiana Creek. Christiana Creek is about 4 miles above New Castle, and leads up to Wilmington, Delaware.

miles: you must not approach this bar nearer than 5½ fathoms, as it is steep to. From Bombay Hook to Reedy Island, the course is N. W., distant eighteen miles.

REEDY ISLAND TO PHILADELPHIA.—Being up with Reedy Island, (which you leave on your larboard hand, to the north of which lies a shoal,) you have also, on the starboard hand, * Fort Delaware, in which is a lantern erected to guide the mariner in his passage, and which you leave on the starboard hand. This fort is built on the Pea Patch, and while passing it keep your larboard hand best on board till you bring the river to bear N. E., or N. E. by N., when you may stand up for New Castle. This place is 40 miles from Philadelphia. When you have passed it about a mile, you give the larboard hand a berth, as there is a flat shoal near half a mile off. If you have a fair wind you may keep in the middle of the river. This river winds from New Castle to Marcus Hook, from N. E. to E. N. E., distant 20 miles. Your course from this to Chester Island is N. E. by E., 4 miles, leaving said island on your starboard hand, and Tinicum and Maiden Islands on your larboard hand, keeping your starboard hand best on board till you come up with † Billing's Port, (which is 12 miles from Philadelphia,) when you will haul up for Mud Fort; but before you come up with this fort, you will see a black buoy in channel way, which you may go close to. Run direct for this fort, which is an E. N. E. course, till you are abreast of it, when you will see a small island on your larboard, and another on your starboard hand, which you must go between. When you have passed between these islands, steer E. by N., two miles, when you must haul up N. E. by N. for Gloucester Point, distant one mile, from which you must keep your larboard hand best on board, and steer N., 3 miles, which will carry you opposite Philadelphia.

TIDE TABLE.

MOON	S. E. by E.	makes full sea at	Cape May.
	S. E.		Cape Henlopen.
	S. E.		Brown and Brandywine.
	S. S. E.		Bombay Hook.
	S. by E.		Reedy Island.
	S.		New Castle.
	S. S. W.		Chester.
	S. W.		Philadelphia.

Setting of the Tides within the Capes.

First quarter flood,	W. N. W.
Second to last quarter,	N. N. W.
First quarter ebb,	E. S. E.
Second to last quarter,	S. S. E.

CAPE HENLOPEN TO ‡CAPE HENRY.—This coast is studded with shoals, lying at a distance off, from 3 to 6 miles from the nearest point of land. The first is the Hen and Chickens, the northern point of which lies E., a little southerly, from Cape Henlopen light, and runs off S. E. by S., 5 miles; the Cap, on which there are 3 fathoms, lies S. E., easterly, 6½ miles; Indian River Shoal, on which there are 3 fathoms, S. by E. ½ E., 19 miles. The Little Gull Bank, on which there are 12 feet, lies E., 10 miles from the south end of Fenwick's Island, Within the Little Gull lies the Gull Bank and Sinepuxent Shoals. The next shoals are those generally known by the name of Chincoteague Shoals, and are clustered around the southern end of Assateague Island, on which there is a light-house, containing a fixed light. These shoals have deep channels between them, but they are only attempted by the coasters. From Chincoteague to Cape Charles the land trends S. S. W. ½ W., with several barred inlets. The land is low, sandy, and marshy.

REHOBOTH BAY lies 9 miles to the southward of Cape Henlopen light-house. This bay is only for small vessels that draw not more than 6 feet water.

The north end of Fenwick's Island lies 10 miles to the southward of the light-house, and separates Delaware from Maryland. It has a grove of trees on it, and you will have 6 or 7 fathoms of water within a league of the land, and a strong current setting to the southward.

CHINCOTEAGUE LIGHT is a fixed light, on the S. E. point of Assateague Island. When you are within half a mile of Fenwick and Chincoteague Shoals, you

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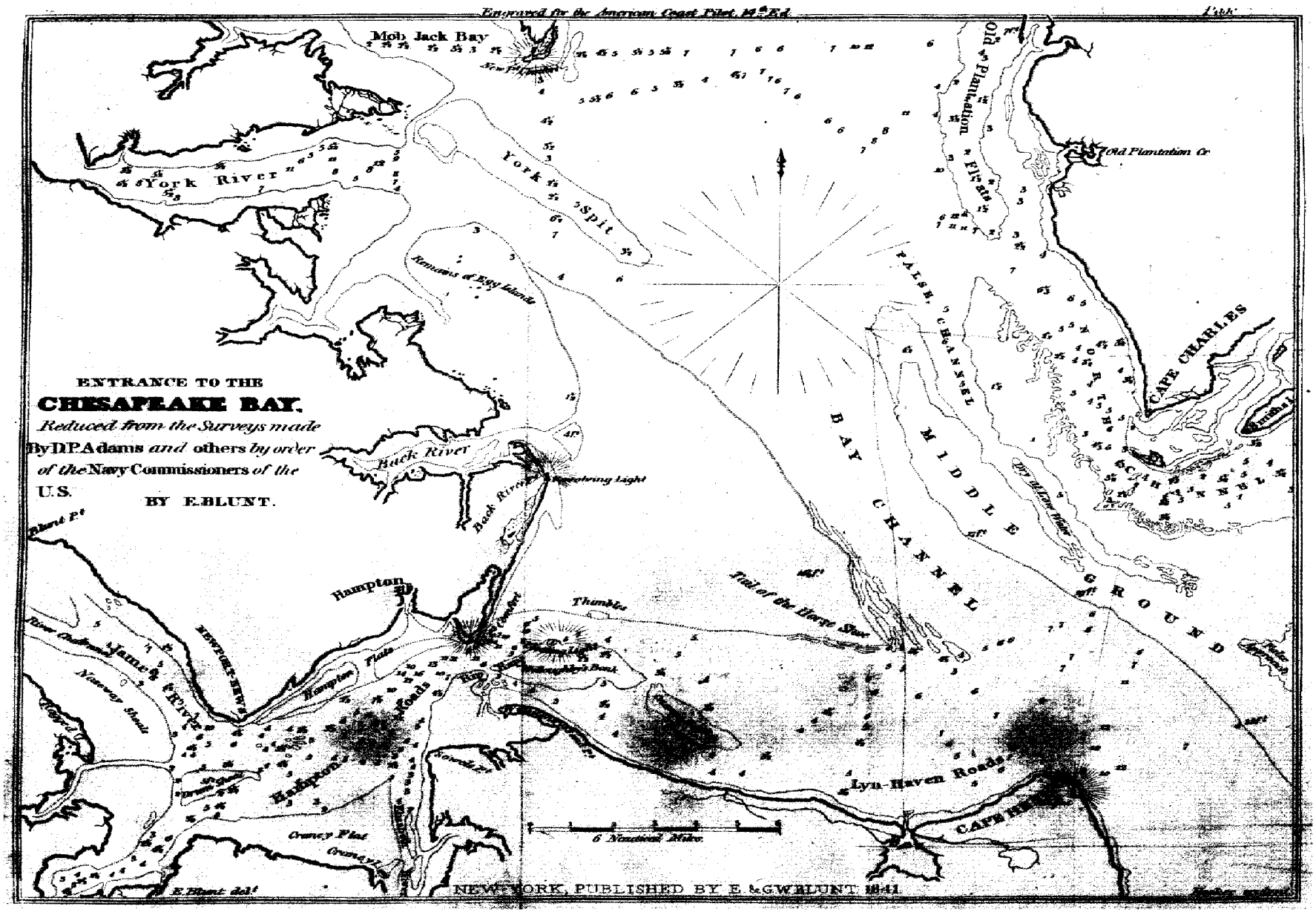
* Fort Delaware has been destroyed by fire, which prevents a light being exhibited.

† This is a high sandy point, and bluff.

‡ This Cape is on the larboard hand going in, and lies 12 miles S. by W. of Cape Charles, both of which form the entrance of Chesapeake Bay. On it is a light-house, whose lantern is elevated 120 feet above the sea, containing a fixed light. The light cannot be seen at a great distance.


Engraved for the American Coast Pilot, 14th Ed.
ENTRANCE TO THE
CHESAPEAKE BAY.
Reduced from the Surveys made
By D.P. Adams and others by order
of the Navy Commissioners of the
U.S.
BY E. BLUNT.
Mob Jack Bay
York River
York Spit
Remains of Egg Island
Old Plantation
Old Plantation Cr
FALSE CHANNEL
CAPE CHARLES
MIDDLE GROUND
BAY CHANNEL
Back River
Hampton
Thimbles
Tail of the Horse Shoe
Hampton Flats
Hampton Roads
James River
Norway Shoals
Crancy Flat
Lyn-Haven Roads
CAPE HENRY
6 Nautical Miles
E. Blunt del.
NEW YORK, PUBLISHED BY E. & G.W. BLUNT 1841.

will have 12 fathoms water. The land from Chincoteague to Cape Charles makes broken land, with islands and several small inlets. There is a good harbor within Chincoteague Shoals, which goes by the same name.

MATOMKIN HARBOR has 12 feet water on the bar at spring tides. In running in for the bar, you will have gradual soundings from 7 fathoms. One cable's length from the bar you will have 2¼ to 2 fathoms.

In running over the bar, keep the north shore on board, and steer S. W. On the larboard hand, one mile from the bar, give the point a small berth, and round in to the N. W., and anchor in 4 fathoms water.

To the northward of the bar, one-quarter of a mile, lies the wreck of a vessel. From the bar up the inlet, the navigation is very dangerous, being filled with oyster beds.

These are very dangerous harbors in a gale of wind, but you may ride along shore with the wind from N. W. to S. W. When the wind blows hard at N. E., or E. N. E., and you are in sight of Chincoteague Shoals, your only chance for safety is to stand to the southward; for you cannot clear the land to the northward, or go into the harbor of Chincoteague. When the wind is to the eastward, it is generally thick weather on the coast. After you pass to the southward of Chincoteague, steer S. S. W. for the light-house on Cape Henry, for the northern part of Machapungo Shoals lies 4 or 5 leagues to the northward of Smith's Island,* and the southern part of them comes near abreast of said island. In steering to the S. W. westward, 5 or 6 leagues S. E. of Smith's Island, you will have 12 or 13 fathoms, and in some places 3 and 4 fathoms. When you are 20 leagues from the land, in the latitude of 37° 30′, you will have from 30 to 35 fathoms; but when to the southward of Cape Henry, you will have from 7 to 8 fathoms, within a league of the land, and a strong southerly current, which in general runs from 2 to 2½ knots an hour.

CAPES OF VIRGINIA.—In coming from sea, and falling in to the northward, you may make an island, called Hog Island, which has a shoal on the N. E. side, 5 miles from the island, and also Machapungo Island; the latter is a smaller island. Hog Island and Smith's Island are about 6 or 7 leagues from each other, and the latter has a light-house on it. Hog Island is longer than Smith's; the trees stand more open, and are not so thick as on Smith's Island, and in going on to the southward from off Hog Island, you will make sand hills which lie between Hog Island and Smith's Island, being a sure mark you have not passed Smith's Island. Be careful not to come nearer than 7 fathoms when off the sand hills, as nearer than that depth the ground is broken.

Smith's Island is the first island after passing the sand hills above mentioned; on the northern end of it there are some straggling trees, which appear like a grove, but which join on to the island. As you draw up with Smith's Island, you may haul into 6 and 5 fathoms, till you get near abreast of it.

Smith's Island is a good place to anchor under, with the winds from N. N. W. to W. N. W., and vessels often come to there if the wind is coming out from N. and westward.

If you intend to anchor there, bring the light to bear W. S. W. and run for it, and you may go in as near as your draft of water will admit, into 3 fathoms or less, if you choose; you will have blue mud and sand, and when you get under way from thence, steer S. by W. till you cross the north channel in 7½ fathoms; keep on until you raise your ground into 5 fathoms on the Middle Ground, then steer S. W., which will cross the Middle in 4 fathoms; keep on S. W. until you deepen into 6 or 7 fathoms, ship channel; then with a strong breeze steer W. by N., which will carry you across in deep water until you raise your ground on the Horse-shoe. When at anchor under Smith's Island, Cape Henry light bears about S. S. W.

In coming in from the southward, bound to Cape Henry, keep in 7 fathoms until you begin to draw up with False Cape, which lies about 7 leagues from Cape Henry towards Currituck; then 9 to 10 fathoms is full near enough to False Cape. After you have got to the northward of False Cape, you may then keep again in 7, 8, and 9 fathoms (ship channel) till you get up with Cape Henry. From off Roanoke the soundings along shore are hard sand all along until nearly up with Cape Henry, when it is sticky bottom, and you will be in channel way.

The shore between False Cape and Cape Henry makes in like a bay, something like Lynhaven Bay, and in thick weather a stranger might mistake it for Lynhaven Bay, and False Cape for Cape Henry, if it is so thick that the light-house on the latter cannot be seen; but in round False Cape it is all hard bottom, and in Lynhaven Bay it is soft or sticky bottom, and in some places very tough bottom.

The passage between Cape Charles and Outer Middle is little known, and not frequented by large vessels. It is only used by small vessels of 8 or 10 feet water.

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* On Smith's Island, which lies north-easterly from Cape Charles, a light-house is erected, showing a revolving light, distinguishing it from that on Cape Henlopen, which is a fixed light.

HAMPTON ROADS.—When abreast of Cape Henry light, steer W. by N., or W. ½ N., till you get on the Horse-shoe, in 5 fathoms, sandy bottom. There are no soundings at 5 fathoms on those courses between Cape Henry and the Shoe. The first soundings on the Shoe, on those courses, are 6 to 7 fathoms, a sticky or tough bottom, and the distance about 4 miles from Cape Henry light, but the 5 fathoms sandy is about a mile farther on the Shoe, (say about 5 miles from Cape Henry light,) where vessels can anchor. Then steer W. until you get on the south side of the channel for an ebb tide; but tide aflood, steer W. ½ N., or W. by N. Those courses will carry you into 5 fathoms on the south side; then you may steer W. N. W., which will carry you into 6 or 7 fathoms, sticky bottom, until nearly up with * Willoughby's Point, and when you deepen your water to 9 or 10 fathoms on your W. N. W. course, you have passed the bar off Willoughby's Point; then bring † Old Point Comfort light to bear W., or W. by S., and run for it until nearly up with it, (say within half a mile,) but take care and go no nearer to Hampton Bar, on the north side, than 10 fathoms, it being steep to; then haul up S. W. by W. till you bring Old Point Comfort light to bear about N. W.; then steer S. W. for the roads, 5, 6, or 7 fathoms, good anchoring, but go no nearer to the south shore than 9 fathoms, lest the bar off Sowell's Point hooks you in. Should you, after passing Willoughby's Point, fall into 14 or 15 fathoms, Old Point Comfort light-house bearing W. N. W., steer up S. W. by W., but go no nearer to Hampton Bar, on the north side, than 10 fathoms, it being steep to, until you pass Sowell's Point, when Old Point Comfort bearing N. E., you will fall into 7, 8, and 9 fathoms, good anchoring. When up with Old Point, steer S. W., which course continued will bring a low tree half way between the light-house and the house occupied by the Colonel, which will carry you inside Sowell's Point; then haul to the southward till the light-boat off Craney Island bears S. by E., which course you continue till up with her, leaving her on the starboard hand, but be careful not to shut the light-house in with Sowell's Point, till the light-boat on Craney Island bears S. by E.

If requisite, when entering the capes, and advisable to anchor in Lynhaven Bay, you may run in, with the light-house bearing W. by S., as this course will lead to the channel way, in from 7 to 10 fathoms, sticky bottom. It is then proper to take soundings towards the southern shore; and in order to this, steer W. until you have advanced to a short distance from the light-house; then rounding the point you may haul in the bay, and drop an anchor as most convenient, in from 7 to 4 fathoms.

REMARKS.—In steering W. N. W., as before mentioned, should you deepen your water to 9 or 10 fathoms, or more, you may know you have passed the bar off Willoughby's Point.

If in going along on the south side you shoalen your water from 5 fathoms, haul off to the northward, and keep in about 6 or 7 fathoms, till you judge yourself nearly up with Willoughby's Point; go no nearer to it than 7 fathoms. By hauling to the northward you will deepen the water. On the Horse-shoe side the bottom is hard sand, and on the south side it is soft bottom, until drawing on to Willoughby's Point, where it is hard: therefore, being on the south side, where the ground is soft, you may always know drawing up with Willoughby's Point as soon as you get hard sandy bottom. Then haul off, as before directed, for Old Point Comfort light.

OF THE THIMBLE.—It is a small lump S. W. from the Horse-shoe, with about 2 fathoms water on it. It is steep to, say 7 fathoms; but being small, it is quickly passed. It lies a little below Willoughby's Point, on the opposite side, to avoid which is the reason why it is necessary to get soundings first on the Horse-shoe. The Thimble is about 1½ or 2 miles off the shore. Near the Thimble you will have sticky bottom, and on the Horse-shoe hard sand.

‡ Back River Point light, which is revolving, bearing N. N. W., you are abreast of the Thimble. The light bears N. ¼ W. from the floating light off Willoughby's Spit, 3½ miles distant.

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* A floating light-vessel has been stationed off Willoughby's Spit, in 3½ fathoms water:—

Old Point Comfort light bearing W. ¼ N., distant	2 miles.
Back River Point light, N. ¼ W.,	3½ do.
Cape Henry light, E. S. E.,	13 do.
Willoughby's Bluff, S. S. E.,	2 do.
The Rip Raps, W. S. W.,	3 do.

Vessels going out or coming into Hampton Roads, should not pass to the southward of the light-vessel. She may be distinguished from the light at Old Point by having two lanterns—one more elevated than the other. A bell will be rung in foggy weather.

† Old Point Comfort light-house lies on the starboard hand, bears W. N. W. from Cape Henry light, 5 leagues distant, and is the guide to vessels bound to Norfolk or James River. It shows a fixed light.

‡ On Back River Point a light-house, showing a revolving light, elevated 40 feet above the river, is built, which serves as a guide to vessels navigating the river.

There is good anchoring all over the Shoe, from 3½ to 4 miles from land, to the tail or outer part of it, and higher in shore for small vessels.

As the setting of the tide varies much at different stages thereof, attention should be paid as well to the bearing of the light as to the soundings, when running up from the Cape to Willoughby's Point, for fear you cross the channel.

From Hampton Roads to Norfolk, the channel is intricate to strangers, and we should recommend anchoring in the road, but the following directions, strictly followed, will carry them to Norfolk:

As you approach Old Point Comfort, you will discover a low tree standing to the westward of the light-house; steer S. W. until you bring this tree over the house occupied by the Colonel, which is the first house to the westward, and painted white; continue this course till up with Sowell's Point, when you may haul to the southward till the light-boat off * Craney Island bears S. by E., observing at the same time not to shut Old Point light in with Sowell's Point, and continue steering S. by E. till you pass the light-boat, leaving her on your starboard hand; then take your soundings off Lambert's Point, on the larboard hand, in 4 fathoms, and steer S. S. E. till you get into 5 fathoms; then S. E. ½ E. till you get up to the fort, 3 miles distant, having from 5 to 6 fathoms.

CAPE HENRY LIGHT-HOUSE.—When coming from sea, in the latitude of Cape Henry, you meet with soundings about 25 leagues off, which you may observe by the color of the water. In the south edge of the bank you will have 40 fathoms water, which will shoal to 20 and still decrease as you approach the shore, generally sandy bottom. In clear weather, you may see the land when in about 10 or 11 fathoms, regular soundings, at which time you will be about 5 leagues to the southward of it. To the northward of the land, in 6 fathoms, the soundings are irregular, and the ground coarser. In coming in, with the wind northwardly, you must be careful of the outer part of the Middle Ground, which lies 9 miles E. N. E. from Cape Henry, and 7 miles S. E. by E. from Cape Charles. You may go so near it as to bring Cape Henry to bear W. ½ S., which will carry you round the tail of it, in 4½ or 5 fathoms water, when you will deepen into 11, 12, or 13 fathoms, and then haul away for the bay, the Cape being steep to. The channel between the Cape and Middle Ground is about 4 miles wide, and 5 and 6 fathoms water close to the latter. When Cape Henry light-house bears W. N. W. ½ W., distant about 3 leagues, it appears thus:

With a fair wind you may bring the light-house to bear W.; but if you have the wind ahead, and are obliged to turn in, you may stand to the southward till the light-house bears N. W. by N., and to the northward till it bears W. by S. You will have 9 or 10 fathoms within a mile of the light-house, and from 6 to 5 fathoms close to the Middle Ground.

HORSE-SHOE.—In coming in by Cape Henry, and no pilot, with a free wind and commanding breeze, tide either ebb or flood, bring Cape Henry light to bear E. S. E., and steer W. N. W., and you will get soundings on the Shoe, 7, 6, to 5 fathoms, as after described; after that, make towards the south side, and follow directions given for Hampton Roads.

TIDE.—The flood tide runs in round Cape Henry and Lynhaven Bay until 11 o'clock, on the full and change, and out of the way of the Chesapeake stream, it flows at 10; in Hampton Roads, at 10½. The tide varies considerably in its direction, according to the time from ebb to flood. The ebb from James and York Rivers sets over the Middle Ground to the eastward, which renders navigation thereabout dangerous in the night.

† NEW POINT COMFORT.—When you bring Cape Henry to bear S. S. E., you may steer N. N. W., 8 leagues, which course and distance will carry you to New Point Comfort. If you wish to anchor at New Point Comfort, which bears from the Cape about N. W. by N., distant 8 leagues, you must take care of the spit that runs off the point about S. E., 2 miles. Keep to the westward of this point of sand, and you may run in under the point, and anchor in 4 or 5 fathoms water, fine bottom, where you will be secure from northerly or N. E. winds.

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* A light-vessel, having one light at her mast-head, has been placed at the extremity of Craney Island Flats, in Elizabeth River, in 4½ fathoms.

† On New Point Comfort, which forms the eastern side of Mobjack Bay, is a light-house containing a fixed light.

Vessels at anchor in Mobjack Bay, are exposed to the wind from E. S. E. to S. E., and I would therefore recommend in that case to go into Severn River, where they will lie safe from all winds. Your directions for this port are to bring the south point of New Point Comfort to bear E. by S., and steer W. by N., 2 leagues, which course you will continue till Severn River bears W. S. W., when you must steer into the river W. S. W., or S. W. by W., which will carry you safe, where you may lie land-locked from all winds. In running for this river, you will make two bunches of trees on your larboard hand, which at a distance appear like two islands; but, as you approach them, you will find they are on the main land. In going into this river, you must keep your lead going; keep in the middle, and go between two points of marsh, and you will have no more than 3 fathoms between New Point Comfort and Severn River, muddy bottom. You may go to sea from this river, with the wind from S. W. to N. W.

In running from York River, when you open Iron Point east of New Point light, and bound up the bay, you will pass York Spit, in 3 fathoms water.

CAPE HENRY UP THE BAY TO BALTIMORE.—When you come in from sea, and are bound up the bay, bring Cape Henry light to bear S. S. E., and steer N. N. W., about 4 leagues, which will carry you to the northward and westward of the Middle Ground, that lies between the two capes, and when you have Smith's Island, (off Cape Charles,) to bear E. by S., or Back River Point light-house W. S. W.,* you will be to the northward of the shoal part. If you have the wind ahead, and are obliged to turn to windward, you must not stand further to the eastward after the light-house, (or the Cape,) bears S. S. E., as the western part of the Middle Ground is steep. In standing to the westward, you may go into 3½ and 4 fathoms, without danger; but in standing to the eastward, you must not go into less than 8 fathoms, as you will be near the Middle Ground.

After you are clear of the Middle Ground, as before directed, and have the Cape to bear S. S. E., and a fair wind, you may steer up the bay north: come not to the westward of north till you have Gwin's Island, which lies off Hill's Bay, 3 leagues north from New Point Comfort, to bear west, to avoid a dangerous shoal, called the Wolf Trap, which lies N. N. E., 2 leagues from New Point Comfort light, and S. E., 2 leagues from Gwin's Island, which is small. From the Wolf Trap steer north, about 11 leagues, which will carry you to the mouth of the Potomac. In running the above course and distance, you will have from 10 to 4 fathoms before you come up with the Tangier Islands, which lie off the mouth of the Potomac River. If you should come into three fathoms, as you approach these islands, you may haul a little to the westward, when you will deepen your water. Off Watts' and Tangier's Islands the soundings shoalen gradually.

If you want to go into Rappahannock River, off which lies a light-vessel, which is about 5 leagues to the northward and westward of New Point Comfort, and 1½ league from Gwin's Island, you must bring the light-boat to bear N. W., and run for it, leaving it on the starboard hand, where you will have from 7 to 3 fathoms.

Windmill Point is remarkable, and it appears, when bearing W. ¾ S., 7 miles distant, as here represented.

View of Windmill Point at the North Entrance of the Rappahannock.

This point is just half-way between New Point Comfort and Smith's Point. The Windmill Reef now extends 2 miles from the point to the S. E. by E., and forms a broad shelf of 2½, 2, and 1½ fathoms, thence shoaling to the dry shore, on the end of which is a floating light, bearing S. E. by E. from Windmill Point, two miles distant, and showing one light.

As you come up with the larboard head of the river, keep your soundings on the larboard hand from 3 to 7 fathoms, and not deepen your water more than 7 fathoms to the northward, to avoid a long spit of sand that runs off 2 miles S. E. from the northern head of the river, which is very steep, but keep round the southern head, in the above depth of water, where you may anchor in 7 or 8 fathoms, good bottom, and lie safe from all winds.

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* The light-house on Back River Point is a revolving light, and bears from

Cape Henry,	N. W. ½ W.	16 miles.
Old Point Comfort,	N. N. E.	5½ do.
New Point Comfort,	S.	13½ do.

If you wish to go into Tangier Sound, bring Windmill Point to bear S. W. by W.; steer in N. E. by E., and you will get soundings on the Tangier Bar in 5 fathoms; the cluster of trees at the fort on the southern Tangier Island will be then seen bearing N. E. You may then edge off and on the southern side of the bar, in what water you please, in 3 to 15 fathoms, hard sandy bottom; but it is not advisable to come nearer the Tangier Bar than 6 fathoms, as it shoalens from 6 fathoms to 2, in 300 yards. It is proper to take soundings on the Watts' Island Spit side, as it is very gradual. Should you wish to anchor, there is good holding ground of sand and clay, Z. Crockett's house bearing N. W., and you will here have good anchorage for small vessels, secure from all winds, except those from the southward and westward. In proceeding farther up the sound, keep mid-channel until you bring the house on Kedge Island to bear west; then steer immediately for the clump of trees on it, until you shoalen your water into 2 fathoms; then steer W. N. W. through the straits; and when you bring Fog Point light to bear S. by E., you are clear of the end of the Middle Ground, which lies in the straits, forming two channels: being then in 3 fathoms water, you will steer S. S. W., to clear a bar, making off from Holland's Island, until you get sufficient water to stand up the bay. This bar is between 4 and 5 miles in length; the bottom is irregular, and of hard sand.

After you are up the bay, as far as Watts' Island, and have it to bear about E. S. E., you will deepen your water from 5 fathoms to 10 and 12, muddy bottom. Continue your course north until Watts' Island bears S. E., and * Smith's Point light, (which is the southern head going into Potomac River,) bears W., southerly, when you will be in 10 or or 12 fathoms water. If you deepen your water to 15 or 20 fathoms, you will be very near the bad spit, or shoal, that runs off from Smith's Point into the bay 1½ league.

When Smith's Point light bears nearly N. by W. ¾ W., 9 miles, and appears as represented in the annexed figure, with a house on its west side open, it leads in a fairway up the channel, equally clear of the shoals to the east and west.

SMITH'S POINT LIGHT-HOUSE.

Keep your soundings in 10 or 12 fathoms on the Tangier's side, as before directed; you may then haul up N. W. by N. for † Point Lookout, which is the northern point of Potomac River, and come to within one mile of the point the western side of the bay, and have 4 or 5 fathoms, muddy bottom. When you are up with Potomac River, and would wish to harbor, having the wind down the bay, you may run in round Point Lookout, giving it a small berth, and anchor in Cornfield Harbor, so called, where you will be sheltered from all northerly winds.

To enter the Potomac, when up with Smith's Point light-house, bring it to bear S. W., about 3 miles distant, and steer N. W., 5 leagues, in from 9 to 10 and 11 fathoms, which will carry you to the mouth of St. Mary's River, lying on the starboard hand, at the mouth of which lies St. George's Island, making a bluff. From St. George's Island, if bound up the Potomac, steer N. W. ¼ W., 6 miles, which will carry you abreast of Ragged Point, lying on the larboard hand, off which you must not go into less than 8 fathoms, and continue N. W. ¼ W., till you drop into quarter less 5 fathoms, when you haul up W. by N., 8 miles, which will carry you above Blackstone's Island, lying on the starboard hand, then W. N. W., till you come in sight of the light-boat off Cedar Point; then N. W., till the boat bears N. ¼ E., and keep soundings on the larboard hand, in 4 and 5 fathoms. When up to Cedar Point, steer for Mathias Watkins' Point, giving it a small berth; then steer up for Cedar Point, also giving it a small berth; from thence the courses to Georgetown are about midway the river.

By a letter addressed to the Mayor of Washington, we learn that the bar at the mouth

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* A light-house is erected on Smith's Point, at the entrance of the Potomac, containing a fixed light. From this point a long shoal, or bar, extends out into the bay, on the end of which a floating light-vessel has been stationed, in 4¼ fathoms water, showing two lights. It bears from Smith's Point light E. ½ N., 3 miles.

Vessels passing up or down the bay, should avoid going between the light-vessel and Smith's Point. A light-house, showing a fixed light, is also erected on Fog's Point, which is the northern end of Smith's Island. From the spot where the light-house is placed, Smith's Point light bears S. 38° W.; Windmill Point bears S. 16° W.; Stingray Point bears S. 15° 45′ W.; Point Lookout bears S. 85° 20′ W.

† On Point Lookout is a light-house, containing a fixed light, of service to those bound into the Potomac, or up the bay, with the wind to the westward. Off the point a bar extends half a mile S. ½ W. The light bearing W., three-quarters of a mile distant, you will have 3¼ fathoms, sticky bottom.

of the East Branch of the Potomac is so much deepened, that there is now a depth of 21 feet at common tide, sufficient for the largest frigate with her guns on board.

When you are up as far as Point Lookout, and have the wind ahead, you have a good channel to beat in, up as far as Patuxent river. You may stand on each tack to 4 or 5 fathoms, but in standing to the eastward, when you have 9 or 10 fathoms, it is best to tack, as the ground rises suddenly to 4 or 5 fathoms, and then lessens into two, hard sand: the western side is more regular. Your course from Point Lookout to Patuxent river, with a fair wind, is N. by W. ½ W., and the distance 5 leagues, in 6, 7, and 10 fathoms water, which will carry you up with Cedar Point, which is pretty bold, and makes the south point of Patuxent River. If the wind is to the northward, and you cannot get into Patuxent (which is often the case) you may run in under Cedar Point, and anchor in 3 or 4 fathoms, good bottom, and secure from the wind down the bay.

A light vessel has been moored in Hooper's Straits, in 2½ fathoms, necessary to lead vessels clear of the bar off Hooper's Island to the north, and the shoals to the south: it is of service to vessels bound into Tangier Sound.

Courses to be observed in running into the Straits.

If from up the bay, bring the light to bear E. by N., and stand for it, which course will take you across Hooper's Island Bar in about 4 fathoms water. Continue on until you deepen into 7 fathoms, then steer E. N. E., until the light bears E., and run for it. Pass the light on your starboard hand, which will carry you into channel-way.

If from down the bay, bring the light to bear N. E., and steer for it, when you will gradually shoal your water on the south side: you may with safety course round the bar or shoal, in 3 fathoms, until you bring the light to bear E., then steer as above.

In thick weather, by night or day, a bell will be rung on board the light vessel at short intervals, and if thick and blowing, it is ordered to be kept constantly ringing.

Patuxent is as remarkable a river as any in the bay, having very high land on the north side of the river, with red banks or cliffs. If you go into this river, give Cedar Point a small berth, and stand to the northward till you have the river open, when you may run in for Drum Point, which is on your starboard hand. This is a low sandy bold point, with some small bushes on it. Double this point, and come to in 2½ and 3 fathoms water, where you will be secure from all winds. In beating into this place, you may stand on the north side for the high red cliffs to 3 fathoms, and to the south side to 5 fathoms water, and in the channel you will have 7 fathoms water. When standing to the south side of the river, you will see some buildings on the north side of the river, above Drum Point; as soon as these buildings come on with Drum Point, you must tack, to avoid a spit that runs off from the south side off the mouth of the river.

If you cannot get up the bay, you may anchor under the high cliffs, and lie safe from northerly winds, in 4 or 5 fathoms water.

If you should harbor in Patuxent, when you come out, bound up the bay, give the high land on the northern side of the river something of a berth, and not haul to the northward until you have got into 9 or 10 fathoms water, as a large spit runs off from the Patuxent Cliffs about S. E., extending from Drum Point to * Cove point, which should be avoided. When in 9 or 10 fathoms, you will be in mid-channel, and your course is then N. by W. to Poplar Island, distant 8 or 9 leagues, which you leave on your starboard hand. In running this course, you will have from 10 to 15 fathoms. When Sharp's Island bears E. you may find 18 fathoms, muddy bottom. If, after leaving Patuxent river, you intend going into Great Choptank river, steer N. by E. 5 leagues, for James' Island or Point, which you must leave on your starboard, and Sharp's Island on your larboard hand, giving both a good berth, as there are long spits off from both these places. After you have passed James' Point, steer away about N. N. E. in seven and eight fathoms, which will carry you in under Sharp's Island, where you may anchor within half a mile of the island, and lie secure from northerly and N. W. winds, and, if you wish it, take a pilot at this place.

After you are up with Poplar Island, and it bears E., you may then steer away about N., distant 5½ leagues, which will carry you up to Annapolis Roads, which affords fine anchorage, and protection from N. and N. W. winds. The channel into Annapolis is difficult and narrow; few vessels ever attempt it. The State House at Annapolis is remarkable for having a large steeple, by which it may be known, and may be seen when abreast of the head of Poplar Island.

In running N. and N. W. from Poplar Island, (off which is a light vessel showing one light, which you leave on your larboard hand) for Annapolis Roads, you pass † Thomas Point light-house; and in a S. E. direction, lies a shoal, which should be avoided, as it is

* A light-house is erected on the end, or nearly south of Cove Point, and contains a fixed light. The lights are 50 feet from the surface of the water, and can be seen after passing Point Lookout, going up the bay, and from abreast of Sharp's Island, going down.

You must not pass close to the end of Cove Point, having a long low point off it, close to which are 7 fathoms.

† Thomas' Point light-house contains a fixed light, and is important to the navigation of Chesapeake Bay, and those bound for Annapolis Road. The buoys off Tally's Point bear from the light N. N. E.

bold to, making it more dangerous. The dwelling house of the keeper stands between two large walnut trees, near the light-house; you will also pass in this distance, on your larboard hand, three small islands, called the Sisters, lying below South River.

After leaving Poplar Island, the next you come to is Kent Island; you may run in under it opposite Poplar Island, and anchor in 6 or 7 fathoms water, and lie secure from all winds, except S. W.

NOTE.—The land on the western side of the bay, from Patuxent to Annapolis river, is something high, with several bays, such as Herring and West River Bays, where the soundings are gradual on both sides, near which there are shoals which should be avoided.

You also have, in running from Poplar Island to Annapolis or Talley's Point, (and which is the southern point of Annapolis River, off which a buoy is placed in 6 fathoms water, bearing E. S. E., one mile distant, and N. N. E. from Thomas' Point light) from 7 to 15 fathoms. If you go into * Annapolis River, give Talley's Point a good berth, and haul in to the westward of the mouth of the river, taking your soundings off the south side in 3 and 4 fathoms water, and pass in between Talley's and Greenberry Points, the latter of which has a buoy off it in 3½ fathoms, bearing from the buoy off Hackett's Point W. by S. 1½ mile, and from Talley's Point buoy N. W. ½ N., 2 miles distant, giving said points a berth of an equal width, and run just above them, where you may anchor in 3 or 4 fathoms, and lie secure from all winds.

After you are up with Annapolis, and bound to Baltimore, when in the middle of the channel, your course is N. by E. ½ E., which will give the best water, until you get the † Bodkin light-house to bear W. N. W., then due N. till the Bodkin light-house bears W. ¾ S. and the two light-houses at ‡ North Point to one, or nearly so, keeping the east a little open with each other, until the Bodkin light-house bears S. W. by W., when you will steer W. by N., until you get the eastern light-house at North Point to bear N., when, if at night, you can anchor in the best water; if in the day-time, when you get the Bodkin light-house to bear W. ¾ S. and the two light-houses on North Point in one, or the bluff of woods on North Point on with a large walnut tree on Sparrow's Point, steer for either N. 60° W. until you get the white rocks to range with the centre of a red bank on the west side of the river; then N. 88½° W., continuing the said course until you get the end of Sparrow's Point to range with a gap in the woods, on Saller's Point, and a white house inland, for which you will steer N. 36° W., until you get Leading Point a sail's breadth open with Hawkin's Point (a dusky wood beyond) then N. 64½° W., with these marks on until North Point bears N. 85° E., then steer S. 85° W., till Hawkin's Point ranges with Leading Point; then N. 61° W.; with these marks on until you get the flagstaff on Fort M'Henry to range with the Washington Monument, which differs from the Shot Towers, from its being white, and stands to the westward of them; steer for these N. 41° W., until you are up with the Narrows between Fort M'Henry and Lazaretto Point, taking care to avoid the Lazaretto bar on the larboard hand, and a heap of ballast stones and Fort M'Henry bar on the opposite hand; then steer for Fell's Point, not forgetting a Middle Ground or Shoal just abreast of Easton on the starboard hand, with which you must not interfere.

You may anchor at Fell's Point, or continue up to the town, as the track is plain. Other directions are, after sailing as before described until you get the eastern light-house at North Point to bear N., you may bring the two lights a little open with a gap of woods on Sparrow Point, which will carry you in 3 fathoms water, soft bottom, being most you will have in this channel, common tides; keep these marks till Bodkin Point light bears S. S. W.; then steer W., or W. by N., into the river, giving North Point lights a berth of about one mile, by which you avoid a shoal off the point, of 12 feet, hard bottom, near which, in 18 feet, soft bottom, is a black Spar Buoy, which you leave on your starboard hand. When abreast of North Point light, steer away for the White Rocks, which you

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* Buoys, beside those named, have been placed at Annapolis, viz.

Buoy off Hackett's Point in 3½ fathoms, bearing from Talley's Point buoy N. ½ E., distance between the two buoys, two miles.

Buoy off Horn Point in 4 fathoms, bearing from Greenberry Point buoy, N. ½ W. W.

Buoy in 15 feet water, in the harbor, Fort Madison bearing N. E., Horn Point S. W., and Horn Point buoy S. E.

Fort Madison is an old fort, on a high red bank, bearing from Horn Point buoy N. by W.

† The Bodkin is a fixed light, requisite for vessels bound to Baltimore. The North Point light serves to show vessels the direction through the Ship Channel, also through the Swash; there are twenty buoys off the Petapsco and in the river, some on bars and others on knolls. As they are now all of one color, it is impossible for a stranger to designate them. They were formerly painted white, black, and the knoll buoys black and white alternately. They are now without paint, and a person unacquainted, is as likely to pass them on the wrong as on the right side.

‡ There are two light-houses on North Point, which exhibit white lights, bearing N. by W. ½ W. from the Bodkin.

will see on the south side of the river, until you are abreast of them, when you must haul to the southward till you bring Leading Point, (which is high bluff woods) within two sails' breadth of Hawkins' Point, and keep it till you are almost abreast of the rocks, when you must again haul to the southward till you bring the said point within a small sail's breadth of each other, which must lead you up to Hawkins' Point, to which give a berth of one-quarter of a mile. When up with Hawkins' Point, you may steer away for the Narrows (on which the fort stands) about N. W. by N., which course has nothing to obstruct you, where you will have from 2½ to 5 fathoms. When you are up with the Narrows, pass between the two points, and give the larboard side a good berth, to keep clear of a shoal just above the Narrows; then haul to the S. W. up for the wharves, or the point which is on the starboard hand, and there anchor, or proceed to Baltimore. If you leave the point, keep your larboard hand on board, when you will find good bottom, from which you may proceed to the wharves, or come to with safety.

There are several small shoals of about two fathoms, on each side of the channel, which are steep, and the channel between them not more than a quarter of a mile wide.

For vessels of small draft of water.—Give Sandy Point a good berth, on account of its bar, that makes out considerably, but you may safely pass it in 8 fathoms. This point is easily known from its having a few small detached round topped pine and cedar trees on it, near its outer extremity, and a brick two story house with wings, a little inland.

When abreast of the point, and pretty near the bar, with a leading wind, steer N. 12½° W., which will lead you to the * Swash Channel, and the course through it; but it will be well to observe the natural inland marks for this channel, which are a small house standing a little to the westward of a large house having a steeple or dome to it, to the east of North Point, up the bay, well on with a tree, as in the margin, farther inland, until you are abreast of the Bodkin light-house. You will not have less than 19 feet common tide, and afterwards not less than 13 feet. Steer with the above marks on until you open a house at the head of Bodkin Creek, or until you open Leading Point a little with Hawkins' Point, when you can cross Bodkin bar and stand up the river for Hawkins' Point, when giving a fair berth to Hawkins' Point Bar, you may run for the channel between Fort M'Henry and the Lazaretto Bar on the larboard hand, when you will follow the directions previously given for vessels of heavy draft of water. [See Chart of Chesapeake.]

Rates of Pilotage.

American vessels pay $3 00 down, and $4 00 up, per foot.
Foreign do. do. 4 00 do. 4 33 up, do.

† BUOYS IN SHIP CHANNEL.—(No 1.) A mast buoy, painted white, to the westward of which you should not go. Another white buoy (No. 2) to range with it, and No. 4, which last will be red, and placed exactly on the Ship Channel range, so that by observing it, you will, without farther notice, know when to run in for the river, as it will range precisely with the two light-houses on North Point. No. 3, a white buoy, upon or near a small knoll of 16 feet hard, on the larboard side of the Ship Channel. No. 5, a black and white buoy on a hard knoll of 15 feet, which lies in the Ship Channel, with the marks nearly on. It is best to leave it on the starboard hand going up. Nos. 9 and 10, two black mast buoys, mark the southern extremity of the Man-of-war Shoals; vessels beating through must not pass this range. No. 6, and No. 7, two white buoys, designate the southern or larboard side of the Ship Channel, and will range with No. 3, before mentioned. No. 8, a white buoy, on the end of the Bodkin Bar.

Directions for coming out of the Susquehannah River with small draft of water only.

Keep the eastern ferry house opposite Havre de Grace (a stone building) astern, and passing near ‡ Point Concord light-house, run for a large tree near the thoroughfare island of Specutia Island, until you just shut in two Lombardy poplars, or till you get

* Navigators who frequent the Swash Channel leading into the Patapsco River, will recollect that a hard knoll or oyster bank lies about two miles above the mouth of Magothy River, having less than 7 feet water on it, with 4 fathoms soft around it, from which the Bodkin light-house bears N. 41° W., bluff off Sandy Point S. 9° W., and two very light green trees, appearing as one to the naked eye, standing over the Red Bank to the northward of Magothy, S. 84° W. to the Red Bank two miles. A small Mast Buoy, painted black and white alternately, with an O upon it, both in the black and white, is placed on the northern edge of it.

† These buoys when first put down, were painted as described, but the person employed by the government to keep them in order, *receives a salary*, whether he neglects his duty or not.

‡ Concord light, at Havre de Grace, is a fixed light, the navigation to which, in passing together with the port, is fit only for vessels drawing not over 8 feet; the channel is narrow and crooked; on the shoals are only 3 feet water. It is impossible to give a stranger courses and distances, who must be guided altogether by the lead, and it should not be run in the night.

Turkey Point and a gap in the Highlands, south side of Elk River to range, nor for the last marks until you open a single tree on the Highlands, south side of Sassafras River, with the easternmost point of Specutia Island, then run for a red bank east side of the bay, having Langsdale's House, which is a large brick one above Havre de Grace, right astern, until you open a single tree, east end of a long ridge of black woods south side of Elk River with Turkey Point, then N. W. westerly for * Poole Island: a short distance below, and on the starboard hand after leaving Point Concord, lies a shoal called Devil's Island, which at low tide is nearly out of water, and on the opposite side of the channel is a very extensive flat or shoal, which also must be avoided by making short tacks when beating in or out of the river.

NAVIGATION OF THE PATAPSCO.

Directions for Mariners, Bay Craftsmen, &c., for sailing up or down the Patapsco, and for passing through the Swash Channel.

The can and log buoys heretofore used to buoy off the Swash Channel and River Patapsco having been removed, and spar or mast buoys adopted in lieu thereof, as being more conspicuous from their erect position, and showing a mast of from 9 to 20 feet above the water, it is conceived necessary to give due notice of the changes, viz.:

The buoys now moored are numbers 5, and from 11 to 20, and are painted, some of them entirely white, others entirely black, and others again black at the surface of the water and at the head, with white between. The white buoys designate the south or larboard side of the channel, coming up; the black buoys the north or starboard side; and the white and black buoys denote the knolls that lie in the channel way, or elsewhere, and to be avoided. Their particular positions are as follows:

No. 5.—A buoy painted black and white alternately, on the edge of a hard knoll of 15 feet, immediately on the Ship Channel range, abreast of the easternmost Man-of-war Shoal, in 3 fathoms, sticky bottom.

No. 12.—A white buoy is placed on the larboard side of the channel, to mark the southeast bar.

No. 13.—Shows the starboard side of the channel, and is placed just at the edge of the 7 feet knoll.

No. 11.—A white buoy in 18 feet, soft, on the outer edge of the Rock Point Shoal.

No. 14.—A white and black striped buoy, in 18 feet, soft, on the edge of a hard knoll of 14 feet, between North Point and Rock Point.

No. 15.—A black buoy, in 18 feet, soft, denotes the shoal off North Point.

No. 16.—A white and black striped buoy in 18 feet, just outside of the Rock Knolls.

No. 17.—A black buoy in 18 feet, soft, on the outer edge of the Sparrow's Point Knolls, of 12 feet, hard.

No. 18.—A white buoy in 4 fathoms, soft, on the outer edge of the shoal, extending from Hawkins' Point Bar.

No. 19.—A black buoy, in 20 feet, soft, on the outer edge of a shoal of 14 feet, hard, extending from Soller's Point Bar.

No. 20.—A black buoy, in 18 feet, soft, on the eastern extremity of the shoal, extending from the Lazaretto.

No. 22.—There is a buoy, painted black and white alternately, on the sunken rock between North Point and Sparrow's Point.

NOTE.—No. 5 shows 12 feet above the surface of the water; all the others show from 12 to 14 feet, except No. 19, which does not show as high.

A good berth should be given to the stripe buoys, as they are expressly placed to mark the shoals.

The black buoys indicate the northern extremity of the channel.

The white buoys indicate the southern extremity of the channel, so that it is dangerous to attempt to pass to the northward of the first, or to the southward of the latter.

Besides the above enumerated buoys, there will be placed a black and white buoy at the old wharf, abreast of Fort McHenry, which will be No 21.

Spar or mast buoys will also be placed, as soon as they can be completed, to buoy off the ship channel leading from the Chesapeake Bay into the River Patapsco, of which due notice will be given.

NEW POINT COMFORT TO POTOMAC RIVER.—From this point a spit extends S. E., 2 miles, which you will avoid by not going into less than 4 fathoms water. About 5 miles N. N. E. from New Point Comfort lies the Wolf-trap Rock, on which there are 12 feet at common tides; between this rock and Point Comfort there are 8 and 9 fathoms. From the spit, which runs off from New Point Comfort, to the

* On Poole Island is a light-house, containing a fixed light; it shows the way through the western channel, in which there are only 7 feet water. Few vessels take this channel, as the eastern is the safest, having from 3 to 7 fathoms water.

entrance of Rappahannock River, the course is N. by W., and the distance 6 leagues. You may keep in 5 or 6 fathoms water. Near the Wolf-trap Rock there are 7 fathoms.

From the entrance of Rappahannock River, off which is a light-vessel, showing one light, to the flat which runs off from Smith's Point light, (which is the south side of Potomac River,) the course is N. by E., and the distance 6 leagues. You may run in 5, 6, or 7 fathoms water. When you draw near the shoal which runs off from Smith's Point, you should not go into less than 7 fathoms. This shoal extends about 2½ miles E. S. E. from Smith's Island; on its extremity there are only 2 fathoms water, and very near to it, eastward, there are 10 or 12 fathoms. The mark for the shoalest part of this sand is a house with a white chimney, standing among the trees on the shore within Smith's Island, open to the northward of the island, and bearing W. When this house bears W. by N., you are to the southward of the extremity of the shoal; and when it bears W. by S., you are to the northward of it. That which adds considerably to the danger of this shoal, in going either up or down the Chesapeake, is the broken islands which lie on the east side of the channel, and the flats of sand, which extend from 5 to 8 miles to the westward from them.

The Tangier Islands lie to the southward of Cooper's Island, and the Tangier Islands and Watt's Island make the entrance of Pokomoke Bay, which bay separates Virginia from Maryland on the eastern shore.

Potomac River separates Virginia from Maryland; its entrance is formed by Smith's Point on the south side, and Point Lookout on the north side. The distance between these two points is about 3½ leagues. On Smith's Point is a light-house.

If you are bound to St. Mary's River, you must give Point Lookout, and also the shore about it, a good berth; and when you approach St. George's Island, you must keep nearer to the main than to the shoal which extends from the island. Your course into the river is N. W., and as it is all open to your view, you may anchor when you please in 5 or 6 fathoms water.

If you are bound to Wicomack, in Potomac River, your course from the east end of St. George's Island to Ragged Point is N. W. ½ W., and the distance 2 leagues. On the south, or larboard side, there are flats lying off from the shore, which in some places extend one mile; come no nearer to them than 7 fathoms. In the middle of the channel you will have 11, 10, 13, 10, and 8 fathoms. You must give Ragged Point a good berth, to avoid the shoal, which extends from it nearly one mile. From Ragged Point to Clement's Island, your course is W. ½ N., and the distance 2 leagues. In the middle of the channel you will have 6, 5, 4½, and 7 fathoms water. On the south side, a little below Clement's Island, is Nomine Bay. From abreast of Clement's Island steer W. N. W. in 6, 5, and 4 fathoms water, until you have Wicomack River open; then pass pretty near to the island, which is on the east side of the entrance, in order to avoid the shoal which runs off from the point on the west side. Steer about N. into the river, and anchor on the south side of Newton's Point, in 5, or 4½ fathoms water.

POTOMAC RIVER TO PATUXENT RIVER.—From Point Lookout a flat runs off a considerable way, which you must be careful to avoid, by not coming any nearer to it than 7 or 8 fathoms water. Opposite this point, the flat of Tangier Islands extends so far to the westward as to narrow the channel of the Chesapeake to about 4½ miles. This part of the flat is steep, and has 13 fathoms close to it. About 2 leagues to the northward of Point Lookout is Point Again, off which, above 2 miles, there lies a shoal. About 3 leagues to the northward of Point Again is Cedar Point. Between them, 7 or 8 fathoms is a good depth to keep in. Nearer to the flat, on the east side, there are 10, 16, 9, and 11 fathoms.

Cedar Point is on the south side of the entrance of Patuxent River. The ground is low and sandy, and has some straggling trees standing on it. From this point a flat extends to the eastward, and also to the northward. On this north side of the river there are high hills, called cliffs, with trees on them; and from this side also a flat extends, but the shoalings on each side of the channel are gradual, and the ground soft. In the middle of the channel there are 8 fathoms water. Higher up is Ronsly's Point, on the south side, and the Drum Point on the north side; the latter is a low sandy point. You may anchor without these points, or you may go further up the river, always observing the following general rule in all the deep bays throughout Virginia and Maryland, viz.: to every point, more especially where the land is low, give a good berth in passing, because spits, or flats of sand, extend from them, and consequently the water is shoal in such places.

CAPE HENRY, OR LYNHAVEN BAY, YORK RIVER.—As Cape Henry S. S. E. would lead you near the tail of the Middle Ground, and as the proceeding with it at S. E. would carry you on the tail and north edge of the Horse-shoe, your keeping the cape on any bearing between S. S. E. and S. E. will carry you through between the two shoals. On the tail, and along the north side of the Horse-shoe, the shoalings are gradual. With Cape Henry bearing S. S. E., or S. E. by S., steer N. N. W., or N. W. by N., until you bring Cape Charles to bear E. by N.; you are then to the northward of the

Horse-shoe, and may steer N. W., or N. W. by W., according as you have the wind and tide. As the ebb sets strong out of the Chesapeake over the Horse-shoe, you must not, with a northerly wind and ebb tide, approach any nearer to the shoal than 5 or 6 fathoms water. When you have brought New Point Comfort to bear N. N. W., and Back River light to bear S. by W., you are then on the tail of York Spit, in 3 fathoms water. When you are a little above Long Isle, you must not come any nearer to the shore than 5 fathoms, until you enter the river above the marsh; then keep in 9 or 10 fathoms, and run up and anchor between York and Gloucester in what depth you please.

With a contrary wind stand towards the Horse-shoe in 4½ or 5 fathoms, and from it into 6½ or 7½ fathoms, until you are abreast of the entrance of Pocasin, where there is a gut of 7 fathoms, which runs close to the entrance; you should therefore be careful to avoid going too far in, and thereby getting on the tail that extends from Toes' Marsh. When you have got thus far up, you should go no nearer to the shore on this side than 7 or 6½ fathoms, all the way up to York Town. On the other side you should not stand any nearer to the small isles on York Spit than 10 or 11 fathoms. Close to the tail of this spit there are 6 fathoms; close to the middle of it there are 10 fathoms; and close to it, abreast of the islands, you will have 13 fathoms, and before you can get another cast of the lead you will be ashore. When you have entered the river, you must not come any nearer to the flat than 8 or 9 fathoms water. This flat extends from the north shore almost one-third over the river.

* CAPE HATTERAS.—This cape lies about S. S. E., 37 leagues, from Cape Henry; between them lie the inlets of Currituck, which are shoal, and New Inlet, on which are 5 feet water. About 6 leagues N. by E. from the cape lie the Wimble Shoals, which are 3 and 4½ fathoms water, extending N. by W. and S. by E. about 3 miles, and is about 3 miles wide. The inner edge of this shoal is about 3 miles from the shore, and the soundings between them 8, 10, and 7 fathoms. About 5 miles N. by W. from the north end of this shoal, and 3 miles S. E. from the north end of Hatteras Island, there lie some small knolls, on which are only 9 feet at low water.

Cape Hatteras Shoals extend 8 miles in a south-easterly direction, with 5 and 6 fathoms on the extreme parts. The most dangerous shoal lies in latitude 35° 10′ N., the middle of which is 4 miles distant from the cape, and has barely 9 feet water. This is called the Diamond Shoal, between which and the cape there is a good passage for small vessels, in moderate weather, or when the wind is off the land; but it would be always safest to go round the shoal in 10, 12, and 15 fathoms.

The light-house at Cape Hatteras exhibits a fine light when in order, and can be seen very plainly in 9 and 10 fathoms water on the outer part of the shoals, when only 10 feet above the level of the sea; but when on board a large vessel, it might be seen in 20 or 25 fathoms. The soundings from the cape are 2, 3, 4, 4½, 5, 6, and 7 fathoms, and then deepen to 9 on the S. S. E. part. There is a current with a south wind which runs N. N. E. two miles per hour, and with a north wind S. S. W. two miles per hour.

W. S. W. from Cape Hatteras, 8 leagues distant, is † Ocracock Inlet, on the bar of which are 9 feet water; this bar is subject to change, and should not be entered without a pilot.

From Cape Hatteras to Cape Henry the ground is fine sand, and to the northward of Cape Henry, coarse sand, with some shells among it.

It is high water at Cape Hatteras Shoals, on full and change of the moon, at 3 o'clock

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* On the pitch of this cape, which is low sandy land, a light-house is erected, painted white, 97 feet above the level of the sea, containing a fixed light. There is a good channel, three miles from the light, keeping the land on board. The light bears from the S. W. part of the outer shoals N. by W. ½ W., and from the S. E. part, N. W., distant 3 leagues; from the S. W. part of the middle shoals, within which vessels bound along the coast generally pass, the light bears N. N. W.

The light at Cape Hatteras, being 85 feet above the level of the sea, will be seen from a considerable distance without the outer shoals, and to a vessel steering from Ocracock W. by N., W. N. W., or even N. W. by W., the light on the cape will first show, and will continue to be seen till the light appears within the bar.

The point of Cape Hatteras having made out into the sea since the light-house was built, the light now stands 1¼ mile back from the point of land that makes out from it.

† At the entrance, on Ocracock Island, a light-house is erected, exhibiting a revolving light, which you leave on your starboard hand entering the inlet. The time of each revolution is two minutes. It is elevated 75 feet above the water.

A floating light is stationed within the point of the 9 feet shoal, near Peach's Hole Swash. She is moored in 2 fathoms water, with the light on Ocracock bearing S. E., distant 2¾ miles; Shell Castle bearing S. W. ½ W., 4½ miles, and the light-boat at the S. W. Straddle W. by S., 9 miles. A bell will be tolled at intervals in thick and foggy weather.

A floating light is also moored at the mouth of Neuse River. She is moored in 4½ fathoms water, sticky bottom, near the upper edge, or western side of the shoal. extending out from the point of marsh, with the point bearing due south, distant about three miles; Gum Thicket bearing S. W. ½ W.; Brant Island due N.; Swan Island S. E., and the S. W. Straddle light-boat due E. A bell of 200 lbs. weight will be tolled at intervals in thick and foggy weather.

and 45 minutes, and the tide flows from 4 to 5 feet, being governed by the winds in the offing, and in easterly gales it runs several feet higher.

On a point of land on the south side of Pamtico River, 35 miles below Washington, running into Pamtico Sound, stands a light-house, 30 feet above the level of the sea, with a fixed light.

Vessels bound to Washington, from the S. W. end of Royal Shoal, on which is a light-boat, will make their course good N. W. by N., which will bring them up the main channel of Pamtico River, and will be within a quarter of a mile of the light.

*CAPE LOOKOUT.—Cape Lookout lies in 34° 37′ N. latitude, and 76° 33′ W. longitude, and the Cape Woods (where the light-house is) in latitude 34° 39′ N., and longitude 76° 32′ W. The shoals extend from the cape 10 miles, in a S. S. E. direction, being broken ground as far as lat. 34° 28′ N. In that latitude there are 14 fathoms water, and from thence to the Gulf Stream the soundings are gradual, 95 fathoms. The tracks are faithfully laid down in the chart, (published by E. & G.W. BLUNT,) together with all the soundings from the outer part of the shoal to the edge of the Gulf Stream.

The outer part of Cape Lookout Shoals lies S. W. ¼ W., 22 leagues from Cape Hatteras, and 22 leagues S. W. ¾ W. from the outer part of Cape Hatteras Shoals. Seven miles from Cape Lookout light lies a shoal which is dry at low water, bearing S. ½ E. from the light; the sea breaks constantly S. E. from this shoal for the distance of 2 miles, which is the S. E. point of breakers. Between this shoal and the shore there are numerous spots, on which are 1½ and 1¼ fathoms; south of this shoal the least water is 2½ fathoms. On the eastern part of Cape Lookout Shoals there are 2½ fathoms; near them, on the northern and southern sides, are 4, 5, and 9 fathoms. On the N. and E. of Cape Lookout Shoals you will have 7 and 8 fathoms, dead, dark, broken shells, with sand.

Old Topsail Inlet, or entrance to Beaufort, lies about 3 leagues W. N. W. from Cape Lookout. It has 2½ fathoms water, but the eastern side of the entrance is formed by a long spit extending westward. The channel in lies first N. E. by E., and then alters gradually round the flat, which extends from the larboard or western side to the N. N. W. In proceeding up to Beaufort, you will have 3, 4, and 3 fathoms in the channel, and may anchor in 3 fathoms at low water.

If you wish to come within the shoals of Cape Lookout, after making Beaufort, keep along the shore at the distance of 2 miles, until you come up with the point of sand, forming a pretty good harbor, with the wind from the N. W. to E., for small vessels. If bound to the northward, keep, as near as you can judge, the same distance, or a little less, from the beach, until you bring the light-house to bear N. W. by N.; you will at that distance have not less than quarter less three; then keep N. E., and you will deepen to 5 and 6 fathoms in a few minutes.

West, 10 leagues from Cape Lookout, lies Bougue Inlet, on which are 8 feet water; W. by S. ½ S., 4½ leagues from Bougue Inlet, lies New River, on which you have 8 feet water; S. W. ¾ W., 6 leagues from New River light, lies New Topsail Inlet, on which are 10 feet water; S. W. ¼ W. from New Topsail Inlet, 3 leagues distant, you make Deep Inlet, on which are 7 feet water; S. S. W. from Deep Inlet, 6 leagues, lies New Inlet, on which are 7 feet water. This inlet is between the sea coast and N. E. end of Smith's Island. It will admit vessels drawing 6 feet, and is about 2 miles wide at its entrance, having 7 feet water, at low tide, over the bar. It continues its breadth to the flat, and is navigable for large vessels 21 miles from its mouth, and 20 miles to Wilmington, to which town vessels drawing 10 or 12 feet can reach without any risk. S. by E., 8 leagues from the New Inlet, will carry you into 15 fathoms, south from the Fryingpan Shoals.

CAPE FEAR LIGHT-HOUSE.—Near the western bend of the Fryingpan Shoal, about 15 miles from the land, on the S. W. end of Smith's Island, Bald Head light-house is erected. It is painted black, in order to distinguish it from the light-house on Federal Point, from which it bears about S. W. by S., distant 8¾ miles, and stands one mile from the sea, 90 feet high, and contains a fixed light. The lamps are 110 feet above the level of the sea, and 50 feet above the tops of the trees which stand on the hills between the light and the sea. Smith and Oak Islands form the main entrance into the river.

To go over the main bar, bring the light-house to bear N. ½ E. The buoy is within the bar, close to it, and on the western side of the channel. From the buoy the light-house bears about N. N. E., distant one and a half mile. On the bar, at high tide, you have 14½ feet, and its rise is 5 feet. From the point the cape the light-house bears N.

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* Cape Lookout light-house is painted with red and white stripes horizontally, and can be seen 16 or 18 miles, and resembles a ship under sail. It contains a fixed light, elevated 100 feet above the level of the sea. The house is surrounded by a small growth of trees, from which a bold sand beach extends in a S. E. direction, about 3 miles, in the centre of which are small hillocks of sand. This light, although seen clearly all night, until near the approach of day, cannot then be discerned, owing, it is thought, to a mist that rises between the vessel and the lamps. It is judged imprudent to approach the shoals of Lookout in the night nearer than 7 fathoms on the east, or 10 on the west side.

W., distant 4 miles, and from the extremity of the Fryingpan Shoal, N. W. by N. ½ N., 5 leagues.

The general direction of the land from Bald Head light-house to Little River, (30 miles from the bar,) is W. ½ S. From the western projection of Fryingpan Shoals to the mouth of Little River, the soundings are from 9 to 10 fathoms, sometimes sand, and sometimes rock.

It may be necessary to observe to strangers, that, in passing the shoals, especially in a dark night, it is most prudent to steer W. in lat. 33° 20′, or 25′ at most, until they shoal their water to 7 or 8 fathoms; by doing this they may be sure of being to the westward of the bar.

Your course from Cape Fear Bar, when in 9 fathoms water, to clear Cape Romain Shoal, is S. W., and distance 72 miles. When sailing towards these coasts it is prudent to keep nearly a degree to the southward of the latitude of the place you intend to make, until you reckon yourself on the edge of the Gulf Stream, when you must be directed by judgment, according to circumstances. Do not, if possible to avoid it, sail to the northward of 33° 20′, or at highest, 33° 25′, until you obtain 10 fathoms water. In this depth you will be within the south or outer end of the Fryingpan Shoal, which lies in lat. 33° 36′. In approaching the coast, in 33° 20′, your first soundings will be from 30 to 35 fathoms; in this depth you will be very near to the edge of the Gulf Stream. You will have fine grey sand, with black spots, when you will get into 17 fathoms; there is a long flat in this depth of water. In steering west you will, for the first 5 or 6 leagues, shoalen the water very little. When you come in 14 fathoms, you shoalen your water quicker, but gradually. You will see the land from 10 fathoms water, if the weather be clear, and may then be sure that you are within the Fryingpan, from the outside of this shoal. To the westward of N. W. no land can be seen, when without the shoals.

The currents on the coast of North Carolina are governed mostly by the wind: during the summer months, the prevailing winds are south-westerly, and the currents then set the direction of the coast to the eastward, and when the southerly winds cease blowing, it changes suddenly to the contrary direction, which is a sure precursor of a N. E. wind.

The land on Cape Lookout is very low, and cannot be seen more than a league in the clearest weather, from on board a small vessel.

[We decline giving directions for sailing into many ports in North Carolina, as all the harbors are barred, and always subject to alteration by every gale, particularly in the equinoctial storms; but the bars create only a part of the danger in sailing into those ports; it is the vast bed of shoals that lies within the bars, with their innumerable small channels, which give to tide so many different directions that even the pilots who live on the spot, find it difficult to carry a vessel in without some accident. Here also the westerly variation appears to cease, and at Savannah becomes easterly.]

NORTH BAR OF THE NEW INLET.—To enter, the marks are, to bring the west end of Buzzard's Bay point of sand on H. Helly's large white house, in Smithville, and the bearings will be S. W. by W., keeping the point of Smithville with these bearings until over the bar; then keep the spit of sand or beach that makes off from * Federal Point light close on board, which will carry you into the river channel, where there is good anchorage all along the sand, in 3 and 4 fathoms water. On this bar there are 10 feet at low, and 12 at high water.

OLD BAR at NEW INLET, or, as now called, THE SOUTH BAR.—In running in, when the light-house on Federal Point bears W., or W. by S., you will make a thick and high hummock of woods, called Merryck's Wood Bluff, before you make the light; but should it bear to the N. of W., you will make the light-house and bluff at the same time, the former of which may be seen in clear weather about 15 miles, from a ship's deck, in about 10 or 11 fathoms water, and, when first discovered, has the appearance of a distant sail. As you approach the light, the water becomes gradually shoal. In 4 to 5 fathoms water, one mile and a half from the light-house, bearing W. S. W. to W., there is good anchorage, soft bottom.

In running in, bring the light-house on with the south end of the barracks, which you will continue till over the bar, and near the beach, and so along the beach, until you are in the river. On the bar at high water, 11 to 12 feet; at low water, 6 feet only. The depth of water, and channel, however, are subject to variation, so that it is not advisable for strangers, except in cases of necessity, to run in without a pilot.

THE MAIN BAR OF CAPE FEAR RIVER.—Vessels running down from the westward, should not approach nearer the Middle Ground, than to bring the cape (which is the most eastern part of the Bald Head Woods) to bear E. by N. When you bring the light-house to bear N. ½ E., in about 4 fathoms water, steer immediately for it, which

* The light-house on Federal Point bears N. E. by N. from Bald Head light, distant about 8¾ miles. It is elevated 48 feet above the level of the sea, painted white, and stands on the main land, north side of the entrance of Cape Fear River, where formerly stood a beacon. The bar bears from the light E. S. E., distant one mile.

will be a little open to the eastward of a pole beacon, with a cask on the top, painted black. A continuation of this course will carry you clear of the Fingers, when you will see a buoy ahead, or a little on the larboard bow, which you will pass, leaving it on the larboard hand; as soon as you leave the buoy, steer N. W., or keep the breakers close on board the larboard side, when you will luff, or bear away, as the water may deepen, or become more shoal, to be ascertained by heaving the lead. This will carry you clear of a long sand shoal that makes off the point of Bald Head, which is dangerous to ground upon, as the flood tide sets directly over, and breaks upon it with the wind from the S. W. In approaching Bald Head, caution is necessary, as the shoals on both sides are very steep, frequently from 6 to 3 fathoms at one cast of the lead. Keep close to this shoal by sounding as above directed, until you reach Oak Island, when you may steer direct for Smithville. Outside of the bar, in 5 or 6 fathoms water, the light-house bearing N., there is good anchorage, in soft bottom. There are on the bar, at low water, 10 feet, and at high water, 14½ feet; and the sea is scarcely ever so rough as to prevent a pilot's boarding a vessel at the buoy.

OAK ISLAND CHANNEL.—Vessels drawing not more than 9 feet water, running into Wilmington through Oak Island Channel, may bring the easternmost part of the lump of trees on the east end of Oak Island to bear N. E. by E., and run for it, which will carry them over in the best of the water, 7½ feet at low water, and 11 feet at high water; as soon as you deepen your water over the bar, steer for the end of the sandy point of Oak Island, till close up with it, then steer E. S. E. for opening Cape Creek, till you deepen into 4 fathoms, then haul up N., or N. N. W., along the beach, till you get up with Fort Johnson, where you may anchor.

RATES OF PILOTAGE *for Cape Fear Bars and River.*

									BARS.		*Open boat.*	*Decked.*
For vessels drawing		6	feet,	and	under	7	feet,	$	5	60	$ 8	58
"	"	7	"	"	"	8	"		6	25	9	37
"	"	8	"	"	"	9	"		7	25	10	87
"	"	9	"	"	"	10	"		8	37	12	55
"	"	10	"	"	"	11	"		10	00	15	00
"	"	11	"	"	"	12	"		12	00	18	00
"	"	12	"	"	"	12½	"		13	33	19	99
"	"	12½	"	"	"	13	"		14	27	21	40
"	"	13	"	"	"	13½	"		15	33	22	99
"	"	13½	"	"	"	14	"		16	53	24	89
"	"	14	"	"	"	14½	"		17	73	26	59
"	"	14½	"	"	"	15	"		21	80	32	70
"	"	15	"	"	"	15½	"		23	10	34	66
"	"	15½	"	"	"	16	"		25	5	37	57
"	"	16	"	"	"	16½	"		26	70		
"	"	16½	"	"	"	17	"		28	60		
"	"	17	"	"	"	17½	"		32	70		
"	"	17½	"	"	"	18	"		39	20		
"	"	18½	"	"	"	18½	"		42	00		
"	"	18½	"	"	"	19	"		44	80		
"	"	19	"	"	"	19½	"		48	65		
"	"	19½	"	"	"	20	"		52	50		

That 30 per cent. upon the present established rates of pilotage, as above, be allowed to decked boats, piloting vessels into this port and out to sea, (which is comprised in the last column.)

For the RIVER, from Fort Johnson to Wilmington.

For vessels drawing		6	feet,	and	under	7	feet,	$ 7	00
"	"	7	"	"	"	8	"	8	00
"	"	8	"	"	"	9	"	9	00
"	"	9	"	"	"	10	"	10	00
"	"	10	"	"	"	10½	"	11	00
"	"	10½	"	"	"	11	"	12	00
"	"	11	"	"	"	11½	"	13	00
"	"	11½	"	"	"	12	"	15	00
"	"	12	"	"	"	12½	"	16	00
"	"	12½	"	"	"	13	"	18	00
"	"	13	"	"	"	13½	"	20	00
"	"	13½	"	"	"	14	"	22	00
"	"	14	"	"	"	14½	"	24	50
"	"	14½	"	"	"	15	"	25	00

From Fort Johnson to Brunswick, or from Brunswick to Wilmington, or vice versa, one half the pilotage from Fort Johnson to Wilmington.

From Fort Johnson to Five Fathoms Hole, from Five Fathoms Hole to Brunswick, from Brunswick to Campbell's Island, and from Campbell's Island to Wilmington, or vice versa, one-fourth of the pilotage from Fort Johnson to Wilmington.

GEORGETOWN.—Georgetown entrance is 18 leagues S. W. ¼ W. from Cape Fear; between lies a bank, on which there are 5 fathoms water. The north end of this bank lies about 5½ leagues S. W. by W. from Cape Fear; it thence extends S. W. ½ S., 3½ leagues. The inner, or N. W. side of this bank, is about 4 leagues from the shore; near to this edge there are 10, 9, and 8 fathoms water: it shoals gradually as you advance towards the shore; this is called Long Bay. Near to the north end of this bank there are 10 fathoms; along its S. E. side there are 8, 7, and 6 fathoms; to the southward of this bank there are several shoals.

In sailing to Little River Inlet, which divides North from South Carolina, you pass Lockwood's Folly Inlet, which lies west from Cape Fear light, 3⅔ leagues distant. The land appears broken, and contains no safe harbor.

In continuing your course towards Georgetown, several other inlets may be discovered in clear weather, and at length you pass North Inlet, about 3 leagues from Georgetown light-house: this inlet is the northern boundary of North Island, on which island the light-house is situated. The entrance into this inlet is from the northward, the south breaker, forming nearly a crescent, runs apparently across the mouth of the inlet: there are generally not less than 6 feet water on the bar at low water, but the depth varies with the direction and violence of the prevailing winds. The direction of this channel has been within a few years considerably, though gradually, changed by the elongation and curve of the south breaker throwing the channel more to the northward. In entering it in its present situation, Georgetown light-house will bear about S. by W., distant 3 leagues: a small, but distinct sand hill, (the most northern on the north end of the North Island,) S. W. ½ S.; the most southern building on the south end of the opposite islands W. by S.; you may then run in between the heads of the two breakers, rounding along the edge of the south breaker, and thus passing between the breakers into the harbor. The flood tide comes in from the S. E., and sets across the south breaker towards the north breaker. On the north end of North Island, about 3 leagues from the light, there is a village of about 20 or 30 dwelling-houses, (a summer residence,) which is distinctly seen from sea, and often mistaken for Sullivan's Island, near Charleston: there are several houses on the north point of the opposite island. To small vessels, this inlet affords a safe harbor; there are two passages leading from it up to Georgetown, but from the shoalness of the water, they cannot be conveniently navigated, except by boats; in case of necessity, however, vessels of 6 or 7 feet draught may be navigated with some delay through the most southern, which is the deepest passage into the bay, or river, leading to the town.

GEORGETOWN HARBOR.—Georgetown light-house is a lofty circular white tower, and black lantern, erected on North Island, which is on the northern and eastern sides of the harbor, at the entrance of Winyaw Bay, on a low sandy spot, and exhibits a fixed light, 90 feet above the level of the sea at high water, bearing N. ⅓ W. from the entrance of the bar, 6 miles distant. From the easternmost part of Cape Roman Shoals, to the entrance of the bar, the course is N. N. E., and the distance 15 miles, and from the southernmost part of Cape Roman Shoal, it bears N. by E. ½ E., 20 miles distant. On the out Cape Shoal are 5 feet at low water, and 9 feet at high water, and a channel within at high water, of 2½ fathoms, from 1½ to 2 miles wide, and 5 fathoms outside, close on board the shoal.

In approaching Georgetown Bar from the northward, the harbor is shut out from view by North Island, and the light-house appears to be situated in a low wood.

In passing the light, either northerly or southerly, vessels will find 5 fathoms water, within 5 miles of the land: on this shoal there are about 7½ feet at low water, about 12 feet at high water, and 5 fathoms all round it. The principal entrance into the harbor lies to the southward of the light-house.

There are several spar buoys placed in the best water on the bar, and in the channel, in sailing by which, the following directions must be observed, viz.: The first buoy on the bar lies directly in the channel, which, of course, may be passed on either side, close to; from this to the second (channel) buoy, the course is about N. W., one mile distant, and when up with it, immediately steer N. E., 1½ mile distant, which is also in the channel, to the third buoy, when you will immediately steer N. by W. for the light-house, 4 miles distant, keeping that course until within 100 fathoms of the light, leaving it on the starboard hand, when you will be in good anchorage.

The North Inlet channel into Georgetown, cannot be recommended, under any circumstances.

Vessels at sea will find deep water, and when the wind is to the southward and westward, convenient and safe anchorage near the land, about 1½ or 2 miles to the northward

of the light-house. A common flood tide rises nearly 4 feet; it is high water on the bar, at the full and change of the moon, about 7 o'clock.

CAPE ROMAN.—Cape Roman is very low land; it has neither tree nor bush, and appears, when seen at a distance, to be a sand left dry by the tide.

The Shoal off Cape Roman runs off S. E., about 6 miles from the light; the outer point has only 4 feet water, with a swash channel of 2½ fathoms, between that and the light; off the point of the Shoal, the water shoals from 7 to 5 fathoms, then directly on the breakers.

From the south entrance of Santee River, to about 6 miles S. E. of Cape Roman, there is a shoal which extends to a considerable distance from the land; the S. E. point of it lies about 4 leagues S. from Georgetown light-house, and the S. point lies about 2 leagues S. E. from Cape Roman. Close to this dangerous sand, there are four and three fathoms; the land is so low that you cannot see it from the deck of a ship, at the extremity of the shoal.

The outer shoal of Cape Roman bears, (as previously described,) from Georgetown Bar. The entrance of Santee River lies between the shoal and the light-house. The south entrance is 2½ leagues from the entrance of Georgetown River, and 3 leagues from Cape Roman. Ships that fall in with the shoals of Georgetown entrance, should not come into less than 4 fathoms water; and although the muddiness of the water is apt to frighten strangers, there is no real danger to be apprehended. The land here is low, and appears, when viewed at a distance, in hummocks, like a range of islands.

By steering W. N. W. from the S. W. part of Cape Roman Shoal, you will soon see * Racoon Key light, which lies about W. by S. from Cape Roman: steer W. S. W., or S. W. by W., in about 5 fathoms water. As there is a shoal runs off about 5 miles S. E. by E. from the N. E. end of Bull's Island, you should take care to avoid it in passing. Senee Bay, or Bull's Harbor, lies between Racoon Keys and Bull's Island. There are shoals lying off the west end of Racoon Keys, and you should anchor near to Bull's Island, in 6 fathoms water.

From the shoal off the N. E end of Bull's Island to Charleston Bar, the course to go clear of the Rattle Snake, is S. W. by W., and the distance 7 leagues. There are four islands between Senee Bay and Charleston Bar, viz: Bull's, Cooper's, Davies', and Long Island. Flats extend from all the islands, along which the soundings are regular. With Charleston Churches northward of Sullivan's Island, you will be in 5½ fathoms water, on the edge of the Rattle Snake; and when the churches are open to the southward of Sullivan's Island, you are clear of that shoal. You should approach no nearer to this bank than 5 fathoms water.

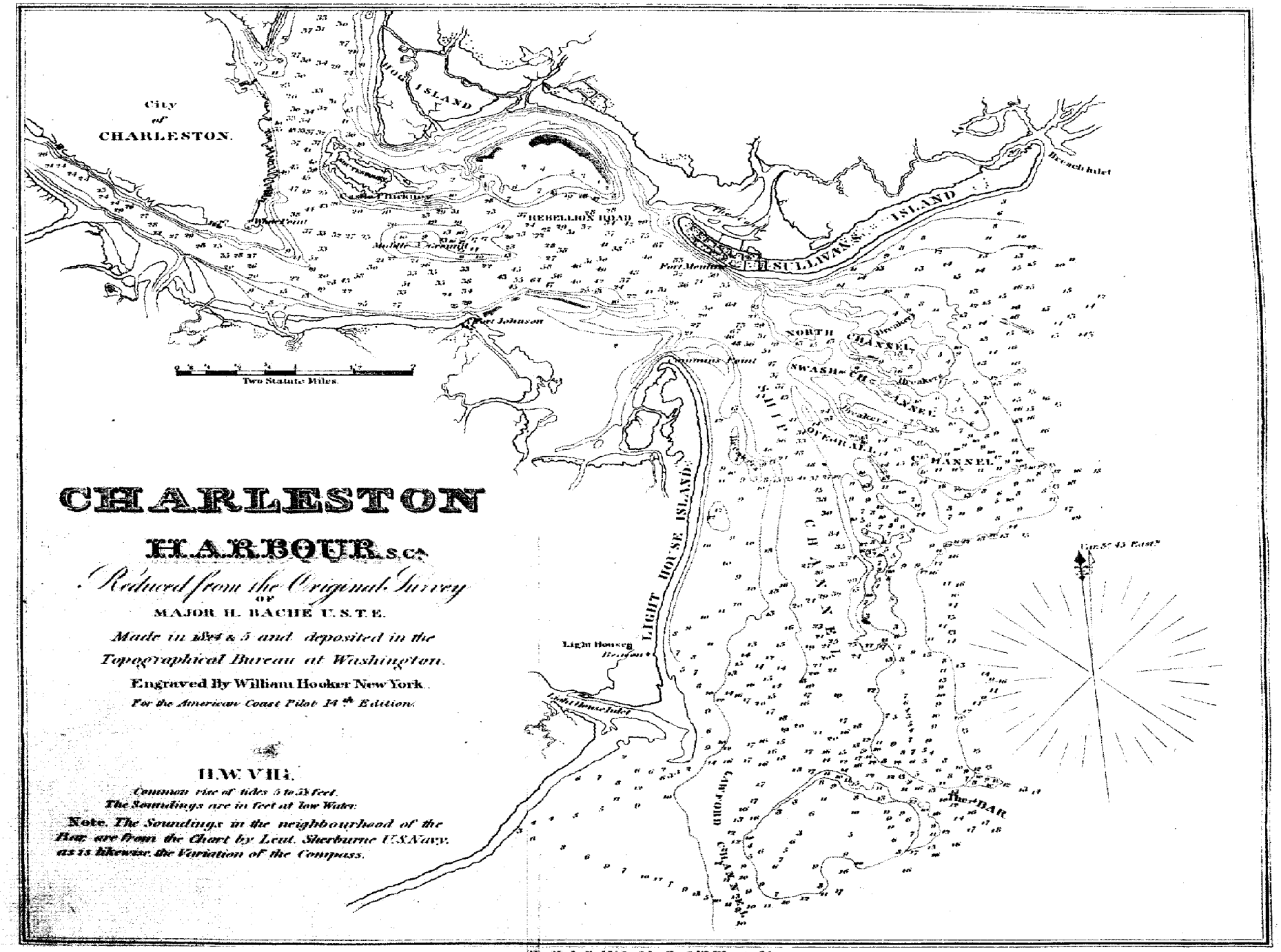
GEORGETOWN, (S. C.,) TO CHARLESTON, (S. C.)—From Georgetown Bar, outside of Roman Shoal, steer S. by W., distance 15 miles.—From thence to Charleston Bar, S. W. by W., distant 39 miles. If, after passing Roman Shoal, you wish to go to Bull's Harbor, steer W. by S., until you bring Bull's Island to bear W. N. W., or N. W. by W. In steering for Bull's Island, you will pass Racoon Keys. Going over Bull's Harbor Bar, at low water, you will have 2 fathoms. Keep the N. E. part of Bull's Island to bear W. N. W., until you are within a cable's length of the shore, where you will have 4, 5, and 6 fathoms water; follow the shore around until you open a Creek, where you may anchor in 3 fathoms, muddy bottom, safe from all winds.

CHARLESTON, (S. C.)—The entrance of Charleston Bar lies in lat. 32° 40′ N. In running in for Charleston † light-house, which may be seen some distance at sea, you will have gradual soundings. When you come near the bar, you may see the north and ‡ south breakers, between which, is the entrance over the bar. In running over the bar, you bring the light-house to bear N. W. by W., and stand for it; and when you make the beacon, bring it to bear about two handspike's length north of the light; this will bring you up with the South Breaker Buoy; give this buoy a berth to the southward of you, of about a cable's length, and the middle buoy a berth to the northward of you, of about half that distance. After passing the latter, stand more to the northward of the North Breaker Buoy, giving it a berth of half a cable's length to the northward of you: in passing which, the Beacon should be nearly touching the north side of the light. You

* On Racoon Keys, near what is termed Cape Roman, a light-house is erected, showing a fixed light, distinguished by red and bright lights. It is elevated 87½ feet from the river, at high water. The intention of this light is to warn mariners of their approach to Cape Roman Shoals, which lie S. E. from it, 6 miles distant. The light-house is painted alternately white and black, beginning with white at the base, and ending with black at the lantern. The pitch, or southern point of Cape Roman, bears S. E. from the light-house; the Old Mill N. ½ W., and the large Racoon Key W. by S.

† Charleston light-house is built on Light-house Island, and contains a revolving light. On Morris Island there are two beacons, intended as the marks for the Overall Channel.

‡ The south breaker has a buoy on the east end, in 12 feet water, and in the middle of this channel is a buoy with a small white flag upon it, in 18 feet water, low tide—on either side of which you may go when running in.



CHARLESTON

HARBOUR S.C.

Reduced from the Original Survey
OF
MAJOR H. BACHE U.S.T.E.

Made in 1834 & 5 and deposited in the Topographical Bureau at Washington.

Engraved By William Hooker New York.

For the American Coast Pilot 14th Edition.

H.W. V.H.

Common rise of tides 5 to 5½ feet.

The Soundings are in feet at low Water.

Note. *The Soundings in the neighbourhood of the Bar are from the Chart by Lent. Sherburne U.S.Navy. as is likewise the Variation of the Compass.*

New York. Published by Ex. G. W. Blunt 1841.

may then stand up for Sullivan's Island. The beacon on with the light carries you on to the North Breakers; care should therefore be taken to keep it open to the northward.

In crossing the bar, care should be taken that the flood tide does not set you on the north breaker, till you come within half a mile of the light-house, when you may anchor in 3 fathoms water. Buoys are in general placed on the bar, in 12 feet water at low tide. The buoys are black.

There is another ship channel to the southward of this, called Lawford's Channel, where you will have from 10 to 12 feet, according as the tide may be. In going into this channel, the course is N. N. W. There is a buoy here also. This anchorage is called Five Fathom Hole, but it has no more than 3½ fathoms. From thence your course is about N. by E., 3½ miles, in 6 or 8 fathoms water, which will carry you abreast of Cumming's Point; when this point bears W., half a mile distant, steer N. N. W. for the S. W. part of Sullivan's Island; you will have from 7 to 10 fathoms water. You may go within a quarter of a mile of Sullivan's Island, as it is bold. Your course from thence to Charleston is about W. ½ N., and the distance 4½ or 5 miles. When you bring Hog Island to bear N., and Fort Johnson to bear S. by W., you are up with the eastern end of the Middle Ground, which you must not go nearer to than 3 fathoms. You may then steer nearly W., keeping in 4 or 5 fathoms water, which will carry you between the Marsh or Shute's Folly, and the Middle Ground. This channel is narrow, not being more than a quarter of a mile broad, as the flats lie off from Shute's Folly one-quarter of a mile. Continue your west course till you come up to the town, where you may anchor in 5 or 6 fathoms water. In running up from Sullivan's Island, stand no nearer to the southward than until you come into 3 fathoms, for fear of the spit, (a Middle Ground that lies off to the N. E. and E. from Fort Johnson's Point) as far as Cummings' Point, nor to the northward nearer than 3 or 4 fathoms.

After sailing from Sullivan's Island, as before directed, you must, if bound through the S. W. channel, or by Fort Johnson's Point, bring the point of land, on which the fort is, to bear S. S. W. and run directly for it, where you will have from 4 to 6 fathoms, When abreast of this point, direct your course about N. W. by W. in 6 or 7 fathoms, about one mile, or until you bring a point of woodland to the northward of the town of Cooper's River, to bear N. N. W., when you may run N. W. by N. about one mile, which will carry you up to the town, and anchor as above directed.

Buoys having been placed to mark out the channel of the North Bar of the port of Charleston, S. C., the following directions must be observed in running for the same:

In standing in to make the outer buoy, (painted red,) off the bar, bring Fort Moultrie, on the S. W. end of Sullivan's Island, to bear N. W. by W. until you are up with that buoy on the edge of the bar. The middle buoy, (painted white) bears from the outer buoy N. W. by W. In crossing the bar you must keep the middle buoy, which is the second buoy, on with the S. W. corner of Fort Moultrie until you are up with it; then haul up for the inner buoy, (painted black,) which bears W. by N. ½ N. from the middle buoy, which lies on the inner edge of the bar; when up with the inner buoy, then steer W. by N. for the main ship channel.

There is a ridge between the outer and middle buoys that extends across the channel, with not more than about 7 feet water on it at low water; at high water from 12 to 14 feet.

Between the middle and inner buoys there are 11 feet of water, by keeping very near the north chain of breakers.

You may see Charleston light-house, in clear weather, in 10 fathoms water. The winds on the soundings govern the current. Var. 3° 45′ E. 1822. [☞ See the Plate.]

RATES OF PILOTAGE, *for the Bar and Harbor of Charleston.*

For 6 feet water, or under,			$8 00	For 13½ feet water,			$23 00
7	do	do	9 00	14	do		25 00
8	do	do	10 00	14½	do		29 00
9	do	do	11 00	15	do		31 00
10	do	do	14 00	15½	do		35 00
11	do	do	16 00	16	do		42 00
12	do	do	19 00	16½	do		50 00
12½	do	do	20 00	17	do		60 00
13	do	do	21 00				

* **PORT ROYAL.**—From 3 fathoms water, south of Charleston bar to North Eddisto inlet, the course is S. W. by W. ¾ W., and the distance 5 leagues; this course will carry you clear of shoals which lie off Stono inlet, which lie further off than any that are in your

* Port Royal is 5 leagues N. E. ¼ E. from Tybee light-house, at the entrance of Savannah River, and has a harbor sufficient to contain the largest fleet in the world.

way to Eddisto. Stono inlet is about two leagues from the south channel of Charleston; between them lie two islands, viz. Morris Island, on which the light-house stands, and the island called the Coffin Island. With the light-house open of the Coffin Island, you will go clear of the Stono Shoals, in 6 fathoms water; but if you shut the light-house in with Coffin Island, you will not have more than 5½ fathoms off Stono Shoals: you will pass close to the breakers, and consequently be in danger: the breakers, unless the sea be smooth, show where the shoal is. In Stono inlet there are 9 or 10 feet water at low water, but is was not much frequented until Charleston was blockaded in the year 1775.

From Stono inlet to North Eddisto inlet, the course is W. S. W., and the distance 11 miles; between them the soundings are regular, and the shoalings, when you are coming from the offing towards the shore, are very gradual; the bar of North Eddisto, and the shoals which are contiguous to it, lie off about 4 or 5 miles from the land. Close the bar and shoals there are 3 and 4 fathoms water: on the bar, there are 9 and 10 feet at low water. South Eddisto is 3 leagues W. S. W. from North Eddisto. The shore of the islands which lie between them may be approached with your lead without danger. The shoalings towards it are gradual.

If bound to the southward or northward, and obliged, through stress of weather, to make a harbor in North Eddisto, you must, when within about 5 miles of the land, open a tree (which resembles an umbrella,) with the south point of the harbor, and then steer in N. W. without any danger, and anchor in 6 fathoms water on the northern side of the harbor. [The tide here is very rapid.] In the harbor, 4 miles west from anchorage, you may get good water.

A LIGHT SHIP, showing one light 22 feet above the sea, in 6¾ fathoms at half ebb, has been moored between the S. E. point of Martin's Industry and the north bank of Port Royal entrance.

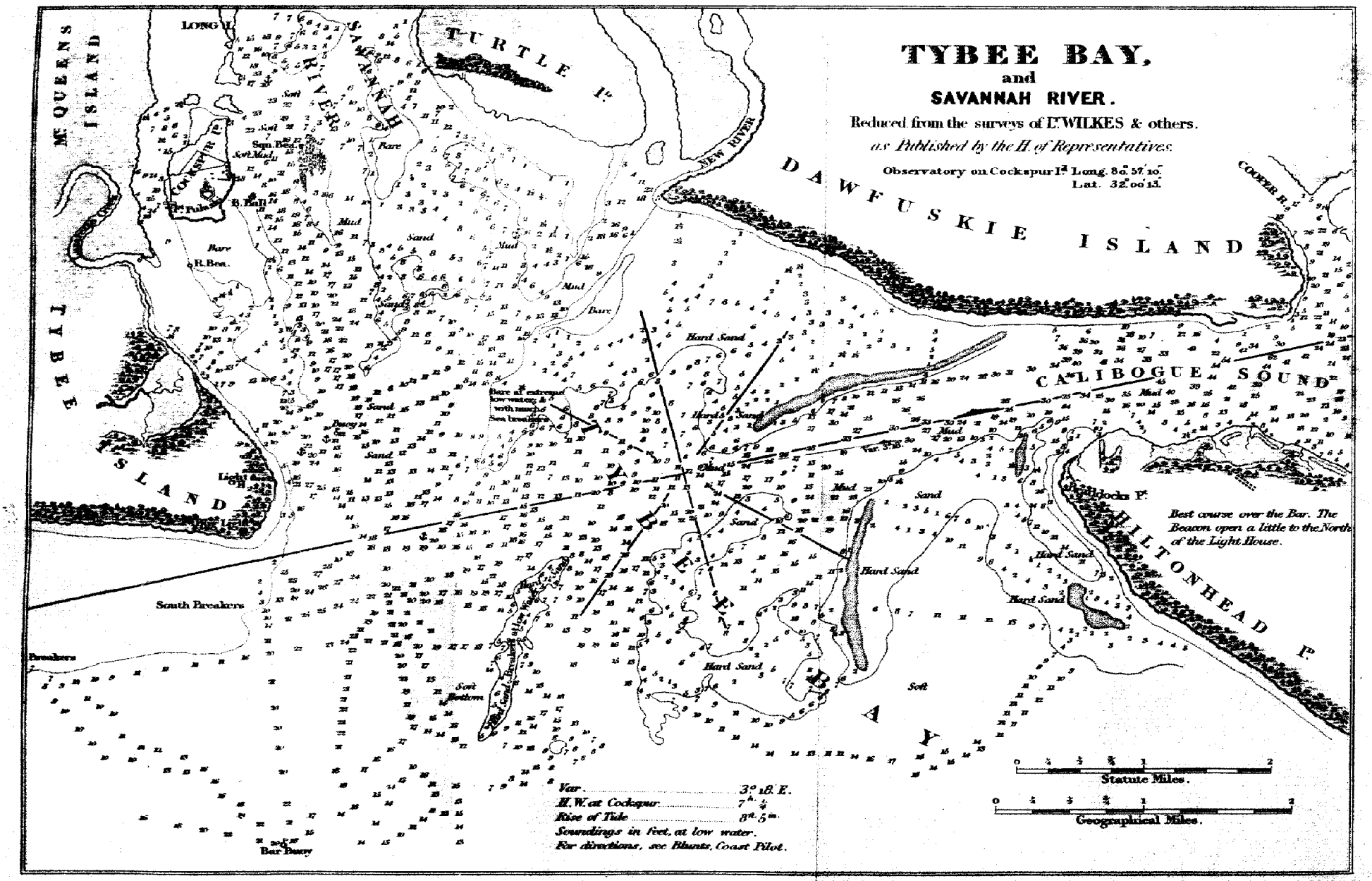
Tybee light bears from it W. S. W. about 18 miles, the north point of Trench's Island N. W. ½ N.

When you are coming from sea, for Port Royal Harbor, you should get into the latitude of St. Michael's Head, which is 32° 6′ N., then steer W. for the head, and when you come within 15 leagues of it, you will have from 20 to 25 fathoms water. Continue your west course until you make the land, which you will do, if the weather be clear, at a distance of 6 leagues, in 12 fathoms water. The land hereabouts is generally low, but the trees are high. Port Royal entrance is known by a small grove of trees, which stand on the west side of it, and tower above all the other trees, like a high crowned hat; hence this grove is called the Hat of Port Royal. Continue to steer as before, keeping your lead going until you get into 8 fathoms water, when you will be about 3 leagues from St. Micheal's Head. You may then steer a point to the southward of west, until you get into 5 fathoms water; then steer more southerly, taking care not to bring St. Michael's Head to the northward of N. W. by N. until you see the great north breaker, called Cole's Care, close to which there are 4 fathoms water: this shoal must be left on the starboard side. As you approach this breaker from the northward, you will see another breaker to the southward, called Martin's Industry; between these two breakers lies the entrance of the channel into Port Royal Harbor, which is about a mile wide. The mark to go clear the north breaker is a parcel of high trees, which stand near the mouth of the River May, and appear like an island, kept just open of Elizabeth Point. Your course through between the two shoals, is W. ½ N. or W. by N. In this channel there are not less than 3½ or 4 fathoms, at low water. Continue to steer as aforesaid between the two breakers, until you bring Philip's Point to bear N. N. W., then steer directly for it, and you will have as you proceed, 9, 8, and 7 fathoms water. When you are abreast of Philip's Point, give it a small berth, and steer up N. by W. ½ W., in 6 and 5 fathoms; in the latter depth you may anchor, very safe harbor.

There is also a channel between Martin's Industry and Gaskin Bank, called the South Channel, in which there are not less than 12 feet at low water. In order to go in through this channel you must, when in 7 fathoms water, bring Hilton's Head to bear N. W. by N., and then steer, with an ebb tide, N. W., and with a flood tide N. W. by N., until Philip's Point bears N. by W. ½ W. You may then steer for the point, and proceed as before directed.

About 3½ miles S. E. from Hilton's Head, and 4 miles S. by E. from Philip's Point, lies the east end of the Joiner's Bank; it thence extends W. N. W. about 2½ miles, and has 3½ fathoms on it at low water. Hilton's Head is on the south side of the harbor, and is a higher bluff point of land than any thereabouts.

Tybee Inlet lies 5 leagues S. W. ¼ W. from the entrance of Port Royal south channel; between them is Hilton's Head Island; it is large, fertile and well inhabited. From this island the Gaskin Bank extends about 8 miles on the broadest part. You may proceed along this bank, in 5 fathoms water. Some, when bound to Port Royal, reckon it best to make the land about Tybee, because the light-house makes that part of the coast distinguishable from any other part. Tybee Inlet is the entrance of Savannah River. Ships which draw 14 or 15 feet water, may go in at Tybee, and proceed through land to



E & G.W. BLUNT, SEPT. 1841.

Beaufort, in Port Royal Islands, and from Beaufort, vessels of 8 or 9 feet water, may go through land to Charleston. From Charleston, vessels drawing 7 or 8 feet water may go through land to the River Medway, in Georgia, which lies 30 miles south of Savannah.

On this coast it is observed, that N. E. easterly, and S. E. winds cause higher tides than other winds, and also, somewhat alter their course. At Port Royal entrance the tide flows, on the change and full days of the moon, ¼ past 8 o'clock. About 6 leagues from the land, in 12 fathoms water, the flood sets strongly to the southward, and the ebb to the northward, further off from the shore there is no tide at all. Near to the entrance of the harbor there is a strong indraught during the flood tide, and an outset with an ebb tide.

SOUTH CAROLINA.—When the wind blows hard, in the N. E. quarter, without rain, it commonly continues to blow violent for some time, perhaps 3 or 4 days; but if such winds are attended with rain, they generally shift to the E., E. S. E. and S. E.

S. E. winds blow right in on the coast, but they seldon blow dry, or continue long; in 6, 8, or 10 hours after their commencement, the sky begins to look dirty, which soon produces rain. When it comes to blow and rain very hard you may be sure that the wind will fly round to the N. W. quarter, and blow very hard for 20 or 30 hours, with a clear sky.

N. W. winds are always attended with clear weather. They sometimes blow very hard, but seldom do so longer than 30 hours.

Gales on the coast of South Carolina frequently increase much in violence toward their conclusion, and then break off at once, leaving a cross sea, with almost no wind.

The most lasting winds are those which blow from the S. S. W. and W. N. W., and from the N. to the E. N. E. When the wind is in any of these quarters, the weather is the most settled.

Thunder gusts are very common on this coast in the summer time; they always come from the N. W. quarter, and are sometimes so heavy that no canvas can withstand their fury; they come on so suddenly, that the greatest precautions are necessary to guard against the effects of their violence.

ST. HELENA SOUND.—The entrance of this Sound lies between South Eddisto Island and the northernmost Hunting Island; it is about 2 leagues wide. This place is navigable by vessels of 7 or 8 feet water only; it is full of sand banks, many of which are dry at low water. Six rivers empty themselves into this Sound, viz: South Eddisto, Ashappo, Cumbahaw, Chehaw, True Blue, and Corsaw. These rivers are all navigable; some of them come 200 miles down the country, but few of them can be navigated by vessels of 6 feet water, for more than 30 or 40 miles from the sound. From the entrance of St. Helena Sound, along the Hunting Islands, to the entrance of Port Royal, the course is S. W. ½ S., and the distance about 5½ leagues. The soundings are regular: you will have 5 or 6 fathoms water.

CHARLESTON BAR TO TYBEE.—When over the bar, in 8 fathoms water, the course is S. W., distant 20 leagues. As you come near the latitude of Port Royal entrance, which is 32° 8′ N., be careful to avoid a very dangerous shoal, called Martin's Industry; it lies 4 leagues from the S. side of the entrance of Port Royal, which is the north side of Hilton Head, the highest land in sight: come no nearer than 7 fathoms, keeping your lead going; and in the night, or thick weather, do not approach nearer than 10 fathoms; the tide of flood sets boldly in. Shoal ground, with 6 or 7 fathoms, coarse shells, lies S. E., 14 or 15 miles from Tybee light. When you get to the southward of Hilton Head, you will see the light-house, which stands on the Island of * Tybee.

SAVANNAH.—If in the night, and you are to the northward of Tybee, be careful of going nearer the Gaskin Bank than 5 fathoms. In fresh winds you take a pilot abreast of the light-house—in moderate weather without the bar. In clear weather you may see Tybee light at the distance of 12 miles.

Near the Gaskin Bank and Martin's Industry, the flood runs strong into Port Royal, to which may be attributed the loss of so many vessels on these banks.

TYBEE LIGHT is a fixed light, 80 feet high, on the north end of Tybee Island.

Off Tybee there are two large coppered buoys, one on the tail of the knoll, in 2 fathoms water, bearing from the light-house N. N. W., the other in 4¼, bearing N. E. by N. from the light-house, in mid-channel, where large vessels may anchor with safety, when wind and tide will not permit to proceed higher up.

A beacon is erected on Tybee Island, which is lighted, and bears E. ½ S. from the light-house, 600 yards distant. It is 10½ feet high.

The beacon light open a handspike's length to the northward of Tybee light, is the direct course over the bar. The best anchoring ground is with Tybee light bearing from S. S. W. to S., the former to be preferred, and distant about one cable's length from the beach. On the bar is a buoy with a white top, in 4½ fathoms water, distant

* Tybee Island lies at the mouth of Savannah River, to the southward of the bar. It is very pleasant, with a beautiful creek to the west of it, where a ship of any burthen may lie in safety at anchor. Warsaw Sound is formed by the southern end of this Island.

4½ miles from the light-house. The deepest water is between the buoy and the south breaker head.

On Savannah Bar there are 18 or 19 feet at low water. On the south breaker there are not more than 7 or 8 feet water; and 1¼ mile from the light, it is bare at low tide.—On the north breaker there are not less than 12 feet for the distance of a mile. The head of Stone Horse Shoal commences at the north breaker, and extends from the land about 6 or 7 miles. [The brig Pocahontas, Capt. Walford, was totally lost on this shoal, the 27th Sept., 1829, at flood tide; Tybee light then bearing about N. N. E., distant about 8 miles, very bold near the shore.]

After getting into 4 fathoms water, you will be over the bar, when you must haul up W. N. W. until the light-house bears S. S. W., then anchor.

The point of shoal which runs down from Cockspur Island, and separates that channel from the ship channel, bears N. ½ W. from the light, and has not more than 5 feet on it at low tide. When to the northward of this point, the light bearing S. S. E., you may anchor in 4 or 5 fathoms.

Vessels drawing not more than 8 or 9 feet may keep the light or island side on board, and run into Cockspur and anchor, as they cannot pass the upper end of the island until half flood, there being only 7 or 8 feet at low tide.

There are three bars, having from two to three fathoms, on the back of Tybee and Cabbage Islands; but they are never to be attempted but in absolute necessity.

NOTE.—Sailing into Savannah, you will observe the following marks and buoys, viz: a large buoy lies on the outer edge of the bar, in the deepest water, having all the leading marks on the beacon and light-house in one, bearing W. ½ N., distant 4 miles. Another buoy lies in the same direction, one mile within the bar; a third buoy lies one mile farther W. by N. from the second, a fourth buoy lies N. W. by W. from the third; after passing which, there is safe anchorage for a large fleet, in 4 or 5 fathoms, at low water, the light-house bearing S. S. W.

The buoys lie and lead in the deepest water, having a channel half a mile to the northward, and one-quarter of a mile to the southward of them, (the narrowest place) nearly the same depth of water; and there are 20 feet on the bar at lowest tides; you may sail either side of the buoys.

Tybee Creek has 11 feet through it, at low water. Forty miles south of Savannah lies Sunbury, a port of entry, at the head of St. Catharine's Sound, between Medway and Newport Rivers, about 15 miles south of Ogechee River. There is a bar here, but the harbor is capacious and safe, and has water sufficient for ships of great burthen.

Warsaw has 10 feet on the bar, but it is too intricate for strangers.

OGECHEE RIVER.—Ossabaw Bar, at the mouth of the River Ogechee, has 18 feet water on it, to cross which, bring Green Island to bear N. W. by W., steer in W. by N. till you deepen your water, then haul up N. W. by N., and you will soon get in 8 or 9 fathoms, when your eye and lead will be your best directions; at the extremity of the channel you will keep Ossabaw nearest on board, until nearly up with the lower part of Buzzard's Island, when the channel will be close under the starboard shore.

Green Island is much higher land, has taller timber than the surrounding forests, containing several hundred acres, covered with pine, which generally has a greenish appearance.

ST. CATHARINE'S BAR, which is difficult for strangers, lies one mile south of the north point of the island, has but 8½ feet at low tide; channel not more than 200 yards wide, the shoals generally dry each side of the bar. It is better for vessels bound to Newport, Sunbury, or up these streams, to enter at Sapelo or Ossabaw, and go the inland passage, which is not difficult.

DARIEN OR DOBOY LIGHT, is erected on the south point of Sapelo Island, 74 feet above the level of the sea, and contains a revolving light, revolving once in five minutes. To distinguish it from any other light-house on the neighboring coasts in the day, the tower is painted red and white, in horizontal stripes.

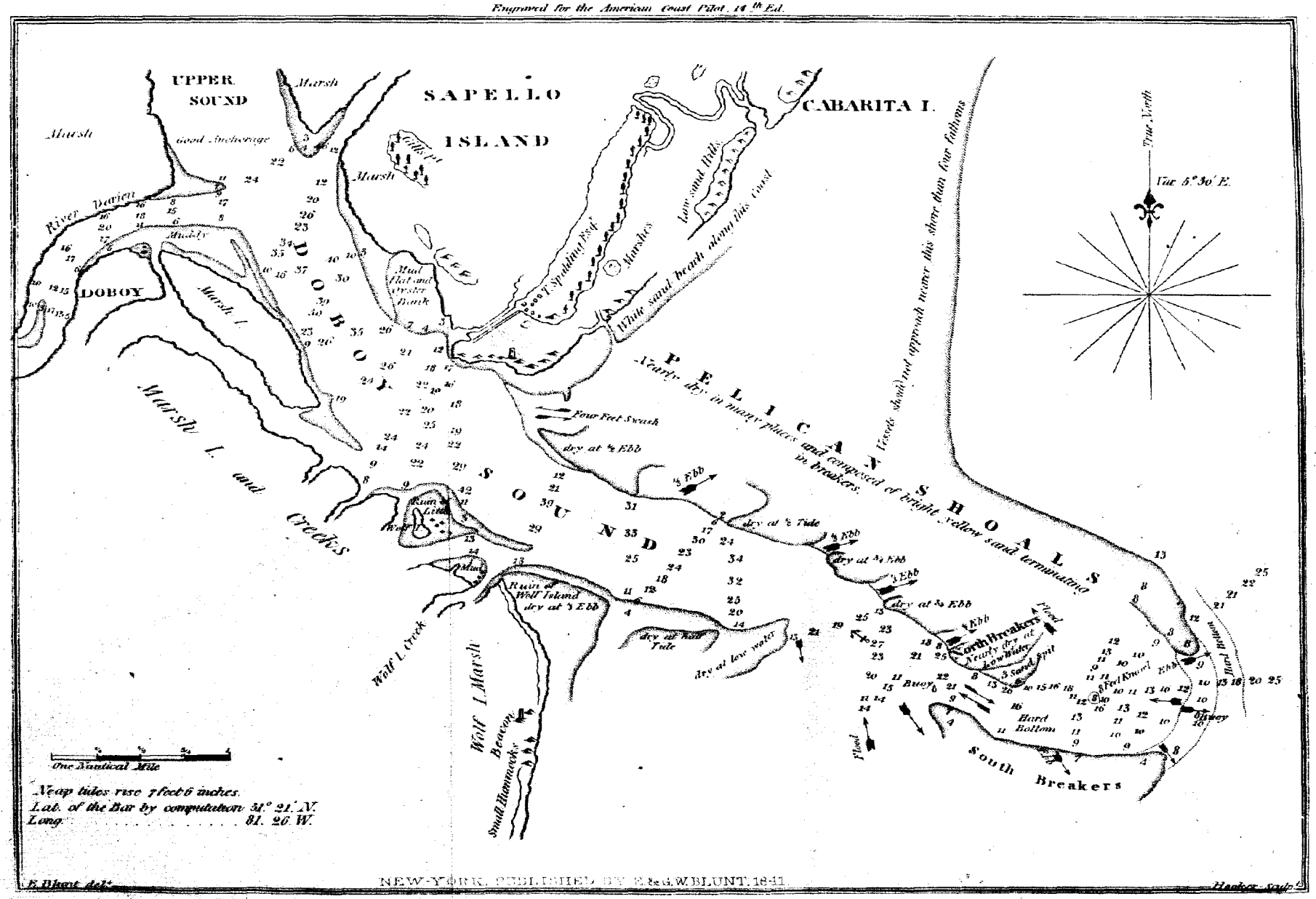
Two beacons have been erected on the east side, and nearly on the north end of Wolf Island, in a S. S. E. direction from the light-house, on the south point of Sapelo Island.

To designate these beacons, the tower of the western, or highest beacon, is painted white. The lantern is 25 feet above the surface.

The eastern beacon is painted black, and is 15 feet above the surface.

DARIEN.—Vessels making the land, when in 5 or 6 fathoms water, will, during clear weather, see the beacons on Wolf Island, which must be brought to bear W. ½ S., and run this course till the buoy on the outer edge of the bar is made, which may be passed on either side. Continue this W. ½ S. course till near the inner buoy, opposite the north breaker, by which you will pass the 8 feet knoll on your starboard hand. In passing them, the north breaker is to be kept on the starboard, and the buoy on the larboard hand, taking care at the same time that the flood tide does not set the vessel on the north breaker. In running this course, the bar is crossed with not less than 12 feet at low water. When abreast of the inner buoy, run from it 1½ mile in a direction exactly N. W. by W., where

Engraved for the American Coast Pilot, 14th Ed.



F. Blunt del.

NEW-YORK, PUBLISHED BY E. & G. W. BLUNT, 1841.

Hinkley sculp.

the anchorage is excellent, in 4 fathoms, at low water, which will bring the vessel in the vicinity of the light-house.

Or you may, after making the light on Sapelo Island, and steering directly for the beacons on Wolf Island, bringing them in a line, and keeping the lead constantly going, the light-house bearing W. ½ N., (true course,) cross the bar in 13 feet water. Neap tide ebbs 7 feet.

The following are the depths of water, bearings, and distances of the two buoys, placed in Doboy Inlet, leading to Darien, Georgia :—

Buoy No. 1, sunk in 18 feet water, at low water, on the outer edge of the bar, bearing E. ½ N. from the beacon on Wolf Island, 3¾ miles distant, and 4½ miles from the south point of Sapelo, in an E. S. E. direction.

Buoy No. 2, sunk in 21 feet water at low water, off the north breaker head, bearing E. ½ N. from the beacon aforesaid, about 2½ miles, and in a S. E. by E. direction, 3½ miles from the south point of Sapelo. This buoy is S. E. by E. ½ E., 5½ miles from Doboy Island, and from the most southern part of the north breaker, one-third of a mile W. by S. ½ S.

TYBEE TO ST. SIMONS.—Bring Tybee light-house to bear N. W. when in 10 fathoms water, and steer S. W. by S., distance 21 leagues, to go clear of the shoal of St. Simons, which lies off St. Simons E. S. E., 2 leagues. There are 4 and 5 fathoms close to this shoal, to avoid which, come no nearer than 8 or 9 fathoms. The Island of St. Simons is on the north side of the sound or harbor of the same name, which lies in lat. 31° 7′ N., and may be known by four trees standing thus † † † †. On the south side of that harbor lies Jekyl Island, on which are remarkable trees, appearing like umbrellas, and thence called the umbrella trees. St. Simons and Jekyl Island beaches are remarkably white. The bar at the entrance of St. Simons' Sound lies 6 miles from the light.

ST. SIMONS.—St. Simons light is on the south point of St. Simons Island; it is 75 feet in height, and contains a fixed light.

On St. Simons Bar there are two buoys; the northernmost is a black buoy, and is in 2½ fathoms at low water; it bears from the light S. E. by E. ½ E., six miles distant.

The southernmost buoy is white, and is on the N. E. point of the south breaker, in 3 fathoms water; it bears S. S. E., 1¼ mile from the black buoy; 3½ fathoms is the least water between the buoys.

Inside of the bar there is a shoal ground, called the Middle Ground; on the northern side there is a black buoy, which bears from the light-house S. E. by E. ½ E., 4 miles distant.

Vessels approaching the bar, should endeavor to get the black buoy on the north breaker to bear W. S. W., and run for it, passing it at two cables' length, leaving it on the starboard hand. When abreast of it, haul up W. N. W., the channel course, to pass the middle ground, leaving the buoy on the middle ground on the larboard hand, giving it a good berth. Then steer W. by N., to pass the light; upon passing which, the vessel is in safety, in ten fathoms water. The shoalest soundings in the channel are three and one-quarter fathoms, at low water. By these directions, any vessel drawing less than 17 feet can come into port at dead low water, The tide rises on the bar six feet, common tides.

LIGHT.—On the north end of Little Cumberland Island, and on the southern side of the entrance to St. Andrews Sound, there is a fixed light.

ST. ANDREWS.—The entrance to St. Andrews is between Jekyl and Cumberland Islands; and on the bar there are 11 feet at low water. There are three buoys at the entrance; one large buoy inside the bar, in 3 fathoms, at low water; one spar buoy on the spit off the north end of Little Cumberland Island; and one spar buoy on a shoal at the mouth of the Great Satilla River.

Bring the light-house on Little Cumberland Island to bear W. by N., when the outer buoy will be in a range with the light-house; and run for it till over the bar, and up with the outer buoy; the south point of Jekyl will then be N. W. ½ W.; alter the course N. W. by W., until between the points of Cumberland and Jekyl Islands, and abreast of the spar buoy off Cumberland Point, leaving it to the south, where will be found good soundings, from 3 to 5 fathoms, near the shore.

Satilla River empties into St. Andrews Sound. Crow Harbor lies up Satilla River, about 30 miles, and is a great timber depot; about 15 miles above Crow Harbor is the town of Jefferson, where vessels drawing 12 feet can go.

ST. MARY'S AND AMELIA BAR.—Vessels from the northward, after passing Jekyl Island, which lies in latitude 31°, ought to keep in 7, 6, or 5 fathoms water, as weather and size of the vessel may permit. As you proceed towards the southern part of Cumberland, you will open Dungeness House, which is about 1¾ mile distant from the south point of said island, and is the only conspicuous large building on this coast; and is hid by the trees when you are to the northward. Southward of this house there is a space of about two miles, with no trees on it, which makes the south point of the island appear, at a distance, like an island of about two miles in length.

ST. MARY'S.—On the the north point of Amelia Island there is a lighthouse, containing a revolving light. Bound into St. Mary's, bring the light to bear W. by N. ½ N., and run for it until inside the bar, which can be known by passing a buoy; and if the buoy should not be there, you must be governed by your lead; you will have ten feet at low water, and 16 or 17 feet at high tide on the bar. After passing it, you will deepen your water; after which, the course up the channel is N. W. by N.; but as the current is variable, persons must be governed by the eye and lead, and at the same time keeping close to the north breaker.

Full sea at St. Mary's Bar, on full and change, at half past 7 o'clock; slack water at 8. Average tides 7 feet.

ST. JOHN'S LIGHT is a fixed light, 65 feet high, on the south side of the entrance to the River.

ST. MARY'S TO ST. JOHN'S.—The course is S. by E., distant 7 leagues to St. John's; in making this place, when bound into St. Augustine, there is a round high bluff, at the south side of the river, known by the name of the General's Mount; the small craft running in from Amelia to St. Augustine generally make it, and take their departure. On the north side of the harbor is Talbot's Island, full of trees, lying north and south. and about the same height with the General's Mount: there are 11 feet water on the bar at high water. In running into St. John's, bring the light-house to bear S. W. ½ W., and open the top of the chimney in the west end of the dwelling house, about 3 feet to the S. and E. of the light; then run in until within the South Breaker Head; then steer S. S. W. for the General's Mount, within a cable's length of the shore; then haul up to the westward, keeping the shore about the same distance from you, to clear the Middle or North Breakers, which show plain if there is any wind. When nearly opposite the swash, incline towards the north shore, or Fort George Island, to clear a flat that makes off from the shore a considerable distance. Spring tides rise 12 or 13 feet; neap tides not more than 10 feet. The currents run out until quarter flood, and sometimes half flood. High water, at full and change of the moon, about 20 minutes past 7. The tides are very much influenced by the winds.

The outer buoy is a large coppered can buoy, in 18 feet at low water, N. N. E. from the light; at about 3 miles distant, S. by W. ½ W., a half mile distant, is a coppered spar buoy, in 10 feet water. There is another spar buoy, S. by W., half a mile distant, in 8 feet water; another spar buoy, S. E. by ½ E., one-fourth of a mile off; one other small spar buoy, S. by E., one-eighth of a mile off, in 10 feet water. The buoys are all well anchored, with heavy anchors, in the middle of the channel.

The St. John's is a long and broad bay, which receives the impressions of the tide at more than 150 miles from its mouth, running parallel with the ocean.

Lake George is a little sea of nearly 60 miles in circumference, at the extremity of which is found a bank of shells, on which you have only about 5 feet water; but at two or three miles above this, the branches of the St. John's reunite, and a broad and deep channel conducts you to a lake.

ST. AUGUSTINE LIGHT-HOUSE is built on the north end of St. Anastasia Island, and shows a fixed light. It is a square tower, painted white, 70 feet high from the ground, exclusive of the lantern, which is 7 feet.

St. Augustine is situated on the main, about 2 miles within the bar, immediately opposite the inlet. When in 9 fathoms water, off the bar of St. John's, the course is S. S. E., distant 10 leagues. The northernmost land of the bay is called Point Cartel. When you are as far to the southward as this point, you will see the Island of Anastasia, in length 15 miles, and on the south side of the bay, on the north end of which is a light-house, showing a fixed light.

The bar at the entrance of this harbor has opened in a new place, rendering the passage much more direct and easy. In crossing the bar with the light-house bearing W. by S., steer W. S. W., which secures 14 feet water at high tide.

Depth on the bar, at	high water,	12 feet.
" " "	half tide,	9 do
" " "	low water,	6½ do

Vessels coming from the northward will run down till the light-house bears W. by S., keeping in 3 fathoms water.

The pilots, in good weather, board vessels outside the bar. They will be on the bar with a flag, and a wave to the right or left will indicate whether the vessel is to proceed either larboard or starboard. When the staff is erect, the vessel will bear down for the pilot boat.

If the wind be to the south, bring the light to bear W.; if moderate, come to, and anchor in from 7 to 9 fathoms water, muddy bottom.

All vessels bound to this port will show, when off the bar, how much water they draw by signal, hauling down the flag and hoisting it again equal to the number of feet they draw.

The tide flows, at full and change, S. E. by S. and N. W. by N., 8 h. 4 m.; variation off St. Augustine, 7° E., 1819.

MOSQUITO INLET.—Sixty-five miles to the southward of St. Augustine light-house is Mosquito Inlet. On the bar there are 5 feet at low water. Rise of tide, 3½ feet. On the south side of the inlet there was a * light-house intended for a fixed light. The town of Smyrna is within this inlet.

REMARKS OFF ST. AUGUSTINE.—From the first of November to the last of February, the hardest gales prevail that blow on this coast, and in general from N. N. E. to S. S. E. The wind any way easterly comes on very suddenly to a gale during the season above mentioned; and these gales give but very little warning. An experienced navigator says: "I was at anchor in St. Augustine Bay, when it came on to blow at E. N. E., and in fifteen minutes I was obliged to slip, and had we not carried sail to the utmost, we should not have cleared the land to the southward." When the wind backs against the sun, with a small rain, you will perceive the sea to rise before the wind comes; then prepare for a gale, which in general will last 50 or 60 hours. If you should be obliged to cut or slip, carry all the sail you possibly can, to get an offing before it increases so as to put you past carrying any sail, which is always the case, and observe, that the flood tide setting to the southward will be of no service to you farther out than 12 fathoms water, when you will be in the southern current until you get into 46 fathoms, which is about 15 leagues from the land, and in the Gulf Stream, where the current runs strong N. N. E. as far to the northward as latitude 35° 15′ N., when it sets more easterly, or about N. E. by N., as far as latitude 37° N.; from thence, as far as the Capes of Delaware, its direction is about E. N. E., and from latitude 38° 57′ N. it sets nearly E.

Directions for making a speedy passage through the Gulf to New York.—When in sight of Memory Rock, steer N. N. W. to lat. 29°; then N. to lat. 30°, (allowing, however, for the effects of strong breezes any way, to clear dangers on both sides,) which will keep you in the whole force of the stream; then N. E. till in lat. of 32°; then steer N. E. by N. until you get into the latitude of Cape Hatteras, which is in 35° 14′ N.; then you may haul up more northerly half a point, till you get on soundings in or near the latitude of the Capes of Virginia. When in 18 or 20 fathoms, and near that latitude, steer N. N. E., 70 leagues, and look out for the Highlands of Neversink, which are 282 feet above the level of the sea, and lie S. S. W. from the entrance of the harbor of New York. When you have nearly made the distance before mentioned, be careful not to run in the night or thick weather; come no nearer than 12 or 14 fathoms.

NOTE.—Along the southern coast of America, you will find no tide farther out from the shore than 10 or 12 fathoms water; from that depth until the edge of soundings, you will have a current setting to the southward, at the rate of one mile per hour: when out of soundings, you will have the Gulf Stream setting to the N. E. quarter, and the farther you get to the northward, it sets more easterly, but not so strong as before mentioned; when you get to the northward of 39°, it sets about E.

The setting of the tide along the shore from New York to St. Augustine.

	Flood.	Ebb.
From the west end of Long Island to Cape May,	W. by S.	E. by N.
" Cape Henlopen to Cape Charles,	S. by W.	N. by E.
" Cape Charles to Cape Hatteras,	S. S. W.	N. N. E.
" Cape Hatteras to Cape Lookout,	S. W. by W.	N. E. by E.
" Cape Lookout to Cape Fear,	S. W. by W.	N. E. by E.
" Cape Fear to Cape Roman,	W. S. W.	E. N. E.
" Cape Roman to Charleston,	W. S. W.	E. N. E.
" Charleston to Tybee,	W. S. W.	E. N. E.
" Tybee to St. Simons',	S. S. W.	N. N. E.
" St. Simons' to St. John's,	S. by W.	N. by E.
" St. John's to the Bay of St. Augustine,	South.	North.

GENERAL REMARKS.

From the Atlantic, when over the Bank, and bound for New Orleans, you may shorten your distance very much by running down the Florida Reef, keeping in colored water in day time, and off into the Stream by night, as a strong eddy, or counter current, sets westwardly along the outside of the reef, between it and the regular set of the Gulf. To do this with advantage, you must calculate to fall in with the Florida coast as early in the forenoon as possible, that you may take advantage of the eddy through the remainder of the day. Your best way, therefore, will be, on leaving the bank in lat. 24° 40′,

* This light-house was never lighted: a few months after being built [by contract] it fell to the ground. It is uncertain when a new light-house will be lighted to indicate the entrance to this inlet.

with a good breeze, to steer W. S. W., 25 leagues, and if at day light * Florida Reef is not in sight, steer West, W. by N., or W. N. W., and make them at once; you will fall in with them between † Key Largo and Old Matacumbe, which has high trees on its north end, the tops of which are quite level, and at first sight appear like table land; keep down in colored water by day light, and at night haul out at a respectful distance, until fairly day light again, when you may haul in to the northward, and again make the land. Or, should you be so far to the westward as between the Marques Keys and the ‡ Tortugas light, where you cannot see the land, unless within 4 leagues of the one or the other, you must keep a lookout for colored water, and when fairly into it, keep down to the westward, and make the § Tortugas, which you may pass at a respectful distance either to windward or leeward, as best suits your fancy, and as the winds will admit of. Between Sombrero Key and ‖ Sand Key light, you may see the beacon on Looe Key, which is 30 feet high, and on which is a large ball painted red; 4 or 5 miles east of Looe Key is a white buoy on a reef, in 3½ feet of water, and between Looe Key and the west end of Florida Reef, you may make the light-house on Sand Key.

Should the wind be far southerly or light, it would be most advisable, on leaving the bank, to keep to the southward, and get under Double-headed Shot Bank, and out of the force of the stream; and with light and westerly winds, (which sometimes continue for several days during the summer,) it is usual to get on the Double-headed Shot Bank, and lay on its western edge for a breeze, or cross over into St. Nicholas Channel, and take advantage of the land breeze from the Island of Cuba, to get to the westward.

DESCRIPTION OF THE BAHAMA BANKS, ISLANDS, AND CHANNELS.

The following directions are confined to that part of the Bahamas which American vessels navigate in their route from the Atlantic ports to those in the Gulf of Mexico.

BAHAMAS.—Under this general denomination are included all those groups which appear on the banks between the Matanilla Bank on the N. W. and Square Handkerchief on the S. E. The principal islands are situated on those remarkable flats, called the GREAT and LITTLE BANKS OF BAHAMAS, which are divided by the channel of Providence, and of so much importance did we consider a correct description of its navigation, being the passage for vessels from the ports of the United States to those of the Mexican Sea, as to induce the author, in 1820, to send the sloop Orbit, under the direction of E. C. Ward, U. S. Navy, to make surveys.

The banks are generally of sand, with coral. The islands are low, flat, and interspersed with porous rocks, of fresh water; but the supply is, however, scanty, it being obtainable only from pools, formed during the rains, or from wells dug in the sand, into which the sea-water filters. In the woods are found the wild hog and the agouti.

Within the jurisdiction of the Bahamas are, therefore, included the Great Bahamas and Abaco Isles, New Providence, Andros, the Berry Isles, Eleuthera, or Ethera, Guanahan, otherwise St. Salvador, or Cat Island, Watland's Island, Exuma, Yuma, or Long Islands, the Crooked Islands, Mayuana, the Caycos, the Inagues, and many smaller groups, hereafter described under the head of West Indies.

LITTLE BAHAMA BANKS, WITH ITS ISLANDS.—The Hole-in-the-wall, which is the southernmost extreme of the Island Abaco, bears N. N. W. from Egg Island, 7½ leagues distant, and the two form the mouth of what is called the North-east

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* A light-house, showing a fixed light, elevated 70 feet above the level of the sea, 400 yards from the beach, and about 7 miles from the Gulf Stream, is built on the south point of Key Biscayno [Cape Florida.] Vessels drawing 10 feet may approach it till within 2½ miles. It is about 7 miles from the Gulf Stream, lat. 25° 40′ N., long. 80° 5′ W., a little south of Cape Florida.

† On the reef off Key Largo is a floating light-vessel, showing two fixed lights, one about 50 feet high, the other 40 feet, bearing from the highest land on Key Largo E. by S., 7 miles distant; from the elbow on Carysfort Reef, N. ½ E., distant 3 or 4 miles; the outer reef [say 14 fathoms water] bearing E., 2½ miles distant, lat. 25° 6′ N., long. 80° 28′ W. It may generally be seen 12 miles, and its object is to warn vessels from the dangerous rocks and shoals near which she is moored. In hazy weather, a bell will be struck frequently, to warn vessels to keep off.

‡ *Tortugas Light.*—Stationary, on one of the Dry Tortugas Islands, near the western extremity of the reef.

§ A spar buoy, painted white, in 15 or 18 feet water, showing 3 feet above the water, is placed at the west end of the quicksands, [Dry Tortugas.] 15 miles E. ½ S. from East Key, which is the most easternmost key, and where there is a shoal of not more than 7 or 8 feet water.

‖ Sand Key light revolves once in 54 seconds. It is S. W. by S., 8½ miles from Key West light, situated directly on the reef. The light is situated 70 feet above the sea.

Channel of Providence; and the Hole-in-the-wall, with Stirrup's Key, forms the eastern mouth of what is called the North-west Channel of Providence; and this North-west Channel's mouth is formed by the Great Isaac, and the western extremity of the Island of Great or Grand Bahama. About one mile west of the N. E. point of Abaco is a fine bay, called Hurricane Bay, with water enough for small vessels.

After passing the Hole-in-the-wall, the land is indented, both on its surface and beach, and trends nearly east and west, forming a slope; the highest land to the eastward. Two miles W. by S. from it lies the southernmost point of the Island of Abaco, and Little Bahama Bank.

From the south point of Great Abaco to Rock Point, the bearing and distance are N. W. by W., 16 miles; the latitude of the latter is exactly 26°; from Rock Point to Key Gorda, on which fresh water may be found, is N. W. by W. ¾ W., 10 miles. Along the edge of the bank, N. W. ½ N. from Key Gorda, in an extent of 6 leagues, is a continued series of keys and reefs, and within these on the bank is Moose Island. In this distance you will have a dangerous rocky shore, on the west end of the bank. About half way between Moose Island and the S. E. end of Great Bahama Islands, are Burrows' Keys.

The Island of Abaco is divided into two parts by a small shoal channel, and when it is seen to the eastward, it forms two pretty high lumps. There are commodious anchorages on the western and southern edges, well sheltered from the sea, one of which is on the western part of Abaco, which from the Hole-in-the-wall bears N. W., and terminates in a bay, 9 miles from the point.

This bay, with winds at N. W., N. N. E., E., and even S. E., affords a good shelter, with a depth of 7½, 8, and 9 fathoms water, and although the wind at S. E. is along shore, it makes no sea, and it is excellent holding ground.

In the bottom of this bay is the channel which divides the Island of Abaco into two parts; a number of houses are erected there by people from New Providence, who come to cut wood. This anchorage is safer in winter than in summer, as during the latter you have constant squalls from the southward, from which the lightning often does harm, and earthquakes are frequent, which drive off the people, who retire to Providence and Eleuthera.

From the west part of this bay a chain of keys extend 20 miles W. by N., after which you will see the east end of the island of Great Bahama, which continues on nearly the same direction for 19 leagues, and the whole of these two spaces of the bank are foul, with reefs and rocks, as far as the middle of Great Bahama, from whence it is clean and has a smooth bottom.

The south-east side of GREAT BAHAMA ISLAND, which is wholly bordered with a reef, forms a bight, which is 14 leagues in length, and very dangerous with strong S. W. winds. Within the S. E., or more properly the south point, there is fresh water; and at this point, in lat. 26° 28′, long. 78° 40′, is a narrow spot of good anchoring ground, having 10 or 11 fathoms. Towards this coast there is generally an outset from the Florida Stream on the west, which, however, varies according to the wind, &c., and at all times it is necessary to give the west end of Great Bahama a good berth, not only on account of its shoals, for if the wind should hang to the southward, you would be embayed.

On the western edge of LITTLE BAHAMA BANK are several keys and dangerous reefs. Off the N. W. point of Great Bahama Island are the Wood and Indian Keys, at a league to the northward of which is Sandy Key, and at two leagues to the N. by W. of Sandy Key is Memory Rock, which stands about half a league within the edge of the bank, and appears when bearing N. N. E. as represented in the margin.

Memory Rock, N. N. E., three miles.

From Memory Rock the edge of the bank trends to the N. W., and at 4 miles from the rock is the south end of a reef which is even with the water's edge. This reef is 2 leagues in length, and is succeeded by several others, to the distance of three leagues more to the north. Between these and the Matanilla Reef the ground appears to be clear, with soundings on the bank in the northern half, 18, 19, and 20 fathoms.

In the extreme western part of the Great Bahama there is excellent anchorage, from which the soundings of the bank run off 5 miles.

When there is a sea from the N. E. on the N. W. point of this bank, in that part of it in 25° 30′, and 40 fathoms, it makes at flood tide a race, and whirlpools, produced by its encountering with the gulf current, so as to cause it to break heavy, and makes it appear like shoals; on the contrary, getting to the southward of this race, you will have smooth sea, and may keep in 15, 16, 14, 13, 8, and 7 fathoms water. The bottom is sand, gravel, and some stones, upon which you may occasionally anchor. On this bank the water is green, and you cannot see the bottom until in 2½ and 3 fathoms, upon which, or in the green water, there never has been any current experienced; therefore the Gulf Stream does no more than touch along the edge of soundings.

The Matanilla should be avoided on a flood. It has been represented in the old charts as extending to 27° 50′ N. It has been sought for in that parallel, and not having been found there, presumed not to exist, but still we think it should be avoided. The Orbit entered on the bank in lat. 26° 45′ N., long. 79° 12′ W.; from thence she steered N., 10 leagues, leaving Memory Rock to the eastward, and the Western Reefs to the westward; from the lat. 27° 15′, long. 79° 12′, she steered N. E. 27 miles, having 20, 16, 15 13, 10, and on the centre of the bank, 4½ fathoms; from thence to the eastern edge, the water deepened to 23 fathoms, and then no bottom, lat. 27° 33′, long. 78° 42′. "The Derrotero de las Antillas" says: "It has been generally believed that this bank terminates in a great reef; but the truth is, that there is none, only the shock of the conflicting currents, particularly when the wind is from the northward and westward, causes heavy overfalls, and the sea to break much, which led to this mistake."

Capt. Livingston, in adverting to this passage, says, "I have been informed that, after Capt. Laso de la Vega discovered there was no reef on the Matanilla Bank, the ship of war El Angel, of 80 guns, was sent from Havana, under the command of Don Dionisio Alcola Galiano, to examine it, and did so most minutely as far as 27° 51′, and found no danger whatever. I have also been told by an intelligent master of a New Providence wrecker, that he has been at anchor on it, and that it is all perfectly safe, with a fine sandy bottom."

The Derrotero also says, "When there is a N. E. swell on, upon the edges of the Matanilla Bank, and in 25, 30, and 40 fathoms, the sea is jumbled up much by the shock of the current, and so forms overfalls or breakers, which seem to indicate a shoal, but there is none; on the contrary, to the southward of these overfalls, you may find smooth water, 16, 15, 18, and 7 fathoms.

De Maine, who surveyed the Bahama Banks by order of the British government, says, "he struck on the Matanilla Bank, and knocked off his keel." We have given all our authorities, and submit to the judgment of the reader.

The extensive chain of keys which borders the northern side of the Little Bahama Bank, extends from the Elbow Reef 34 leagues W. N. W., and the late delineations prove how very inaccurately they have ever before been represented. The bank which supports these keys is generally shoal, but there is a passage between them and the Abaco Isles, having from 4 to 2 fathoms, which leads to the centre of the bank. The entrance to this passage is close to the west of Great Guana Key, and the Whale Key Rocks in lat. 26° 45′, long. 77° 6′. To small vessels it affords excellent shelter between the keys and Abaco.

But it is to be noted, generally, that a very heavy swell commonly sets upon this coast; and it is never advisable for a stranger to advance nearer than two leagues, as the wind is mostly from the eastward. This is the case along the whole of the north-eastern keys, and therefore, when sailing in this part, whether beating up or running down, a too near approach is both unnecessary and dangerous.

ABACO, OR THE HOLE-IN-THE-WALL.—The N. E. point of the Island of Abaco lies in latitude 26° 17′ N., longitude 76° 57′ W. When in its latitude, distant nine miles, steer S. by W. ¾ W., 12 miles, which will carry you on the bank off the Hole-in-the-wall, in about 14 fathoms water. The first island to the northward of the N. E. point, is Little Harbor Key. North of this, Linnyard's Key, and still farther north, Little Guana Key. Linnyard and Pelican Keys run S. by W. ½ W., and N. by E. ½ E. The distance between Linnyard's Key and Abaco is about two miles, fine sandy bottom, clear of rocks, and good anchorage, and bears north from the N. E. point of Abaco.

On the N. E. side of the island of Abaco, in a direction N. N. W. from said point, N. W. from the south, and S. W. by S. from the north end of Linnyard's Key, is a good watering place, called Weatherford's Well. To enter the channel leading to the watering place, which lies between Linnyard's Key and Little Guana Key, you must keep a small island which forms the north side of the channel, (about 300 yards from Linnyard's Key,) well on board on your starboard hand, and you will pass the bar in 3 fathoms, and find good anchorage in 4 or 5 fathoms water, within about two miles west from the north point of Linnyard's Key. This channel is far preferable to the one at the N. E. point of Abaco, independent of its safety and facility in getting water, as you may approach within a mile and a half of the watering place with three fathoms, or come immediately abreast in two fathoms, within 300 yards of the shore. Wood may be had in abundance among the keys, together with shell and scale fish.

The water breaks where there is danger, with the wind to the eastward, and it is advisable to have a lookout aloft while going in.

The eastern part of the coast is completely iron-bound, and fragments of wrecks are found on all its shores and keys.

The first point, south of the N. E. point of Abaco, is called Rocky Point. S. S. W. ½ W. from this point, 6 miles distant, is a reef of rocks 9 miles in length, and 1½ in breadth, running in the same direction as the shore, inside of which is Cheeric Sound, which makes a channel between the two.

After passing the reef which lies off Rocky Point, the water is bold to within half a mile of the shore, till up with the Hole-in-the-wall.

The land between Rocky Point and the Hole-in-the-wall forms a deep bay, in which you must be careful not to be caught with a south-easterly wind.

PROVIDENCE CHANNEL, BAHAMA BANK, with its islands, Gulf Passage, and the FLORIDA COAST.—In preference to running down for Rocky Point, (which lies about 2 miles S. S. W. from the N. E. point of the Island of Abaco,) where, if you get embayed, you must lie up S. S. E. and S. E. by E., to run along the land, it is more prudent to run into the latitude of the Hole-in-the-wall, and with the wind any way to the southward of east, it is presumed every man would do it.

ABACO LIGHT.—At one-third of a mile from the Hole-in-the-wall, this light-house has been erected, in 25° 51′ 30″ N. lat., and 77° 10′ 45″ W. long. Its base is 80 feet above high water, and the tower is 80 feet high. The light revolves once in every minute, and may be seen in all directions, except where the high parts of the island intervene; and being 160 feet above the level of the sea, it will be visible in clear weather at the distance of 15 miles to an eye elevated 10 feet.

17	do.	do.	20 do.
19	do.	do.	40 do.
21	do.	do.	80 do.

There is good anchorage, [during the ordinary winds,] in 10 and 11 fathoms, with the light-house bearing E. by N., about half a mile from the shore. The time of high water, at full and change, is at 8h., and the tide rises 3 feet.

HOLE-IN-THE-WALL.—The Hole-in-the-wall lies in latitude 25° 51′ north, longitude 77° 10′ west, and is the south-east point of Abaco. By making Rocky Point in the day time, you may have a safe run on your S. by W. ¾ W. course, 12 leagues, and then, if you do not choose to run, lay by, should it be in the night. The generality of the vessels make the land too far north in the latitude of 26° 10′, or 26° 20′, because an opinion prevails that the land thereabouts is soonest seen, and are not aware of its forming a bay to the south and west. If, at night, they make the land in the parallel of 26° 10′, with a strong breeze from the N. E., they are so close in shore, before they can discover the land, that it is almost impossible to clear it, for the land, in that latitude, trends a little to the westward, forming a bay, a few miles north of the * Hole-in-the-wall, with a reef of rocks outside, in one part, half a mile from the shore; and should they make the land farther north, the danger, with a scant wind, is still greater, as there is constantly a heavy swell setting on the shore.

Vessels should run down their longitude in the parallel of 25° 50′, or from that to 26°, and not farther north. By keeping in this latitude they cannot miss the Hole-in-the-wall, and they will likewise avoid the land on the south or Harbor Island side.

Off the Hole-in-the-wall lies a bank, in a S. E. direction, 7 or 8 miles in length, and about 4 miles broad in the middle, ending at a point on the S. E. extremity.

Soundings taken on the bank.

Hole-in-the-wall,	W., 2 miles	12 fathoms.	
"	W. ½ N., 5 miles	15 do.	
"	W., 7 miles	60 do.	no bottom.
"	W. by S., 6 miles	30 do.	no bottom.
"	W. ½ S., 3 miles	13 do.	
"	W. ½ N., 3 miles	12 do.	
"	W. by N., 2½ miles	11 do.	
"	N. W. ½ N., 2½ miles	15 do.	
"	N. W. by N., 3 miles, off the bank.		

Beyond 15 fathoms there were no soundings with 80 fathoms. You may know when on this bank, as the water changes at once from a dark sea blue to a beautiful vivid green, is more agitated by a ground swell, and discovered the moment you are off, particularly with a S. E. wind, at which time the above soundings were taken.

The Hole-in-the-wall, (or Hole-in-the-rock,) is an arch through the land, about 10 feet wide, and 4 or 5 feet high, the bottom nearly one foot above the water, which breaks through the Hole, and may be seen when bearing S. S. W. to W. S. W., and N. N. E. to E. N. E., and at first sight appears like a sand bluff, but at 3 or 4 miles distance may be plainly distinguished to be an arch-way through the land.

South from the Hole-in-the-wall, 100 yards distant, is a rock, 60 or 70 yards long, hollowed out all round at its base by the water, which may be doubled within half a mile.

On the south point of the main land is another corresponding projection, both which appear to have been caused by some convulsions of nature, of which the whole coast bears evident marks. It is covered with fragments of vessels, spars, &c., and the western

* The Hole-in the-wall is seldom seen when to the eastward of it, as it is not open until very near the shore, or when you are S. W. of it.

side has a complete barrier of stones, formed on the beach, above the tide mark, both by nature and the S. W. gales, which at times blow very hard.

Five miles to the westward of the Hole-in-the-wall, and about 300 yards from shore, the soundings are regular, 2½ and 3 fathoms, and deepening rapidly as you leave it.

One-quarter of a mile off the S. W. part of the island, you will have 2 fathoms, fine level sandy bottom. The land here is low, and covered with brushwood. Here the ebb sets N. E., and tide rises 3 feet.

Vessels of any draught ought not to approach the land nearer than about 400 yards, where they will lie in about 4 fathoms water. Inside this the water shoals suddenly to two fathoms.

Vessels in the night, or in foggy weather, may run to the westward, when in latitude 25° 46′ N., and sound till they get in 14 or 15 fathoms, and be then sure to clear the Hole-in-the-wall by a west course, six miles, when it will bear north, and then run W. ¼ N., sixteen leagues, when * Stirrup Key will bear south, six miles distant. Vessels running down in the latitude of the Hole-in-the-wall, will not get soundings till up with it.

In taking your departure from the Hole-in-the-wall for the Great Bahama Bank, steer west twelve leagues, and if the land be not in sight, haul W. S. W., or S. W. by W., and make the † Berry Islands; keep down past these islands, and keep a good lookout for the westernmost key, called Stirrup Key, before mentioned, which lies in latitude 25° 48′ N., and longitude 78° 2′ W.

Extract from the log-book of the surveying sloop Orbit.

"In approaching the Berry Islands, the water is bold close in; two and a half miles from the shore, 11 fathoms; two miles, 9 fathoms; one mile, 8 fathoms; the northernmost part of Stirrup Key bearing W. by N., three and a half miles, 7 fathoms; W. N. W., two and a half miles, 8 fathoms, rocky bottom; west, one mile, 7 fathoms; W. S. W., three quarters of a mile, 9 fathoms; and all along to the westernmost key, 8, 9, and 10 fathoms, generally fine sandy bottom. The moment you get on soundings, in approaching the Berry Islands, the water changes color.

"Sailed around the Berry Islands till they bore N. N. E., two miles, and had 5, 4, 3, and 3½ fathoms; and far as five miles, 4, 3, 4, 4, 3½, 4, 3¾, and 3½ fathoms; N. by E., six miles, 2½ fathoms. West Berry bearing N. N. E., and Blackwood's Bush S. S. E., course W. N. W., the soundings were 2, 4, and 5 fathoms; at 2¾h. steered W., 4 fathoms; at 3h., S. S. W., 7 fathoms; at 3½h., S. S. W., 7 fathoms; 3¾h., 6½ fathoms; at 4h., 6 fathoms; at 4¼h., 5½ fathoms; at 4½h., 4¼ fathoms; at 4¾h., 3½ fathoms; at 5h., 3 fathoms; at 5¼h., 3 fathoms; at 5½h., 2½ fathoms; at 5¾h., 2½ fathoms; at 6., 2¾ fathoms; at 6¼h., 2½ fathoms; at 6¾h., 2¼ fathoms; at 7h., only 11 feet, and came to anchor among black patches, which we sounded and found to be flat rocks, about one foot high, covered with weeds. The water was shoal far to the westward of this. Vessels should not go among these black patches; the regular channel is quite free from them, and the water is muddy, having a milky appearance, which prevents the bottom being easily seen."

The best courses for crossing the Bahama Bank are the following, viz: when Stirrup Key bears S., 8 miles distant, (at which time it can be just seen from deck,) steer W. S. W., 6 leagues, then haul to S. W. by S., 10 leagues; thence S. S. W., or between that and S. W. by S., to latitude 24° 55′, when you may keep away W., and make ‡ Orange

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* Off Stirrup Key there is good anchorage in 7 fathoms. To get shelter from strong easterly winds, in order to repair any damage or to obtain water, you may anchor to the west of the westernmost island, in 7½ or 8 fathoms, on good holding ground. W. S. W. from Stirrup Key, 4 miles distant, the Brig Dromo struck in 9½ feet, hard coral bottom, having 2½ fathoms to the S. and W. on each side, and 5 fathoms to the northward. On Stirrup Key there is a settlement, and a Custom House established: the place is called Williamstown. Here refreshments of every kind can be obtained.

† The Berry Islands consist of about thirty large keys, with innumerable smaller ones; they lie to the N. E. of Andros Island, the south-easternmost of which is Frozen Key, and the northernmost Stirrup Key. There are soundings all round the group; and 20 fathoms may be found at two miles from any of the keys. The surface of the bottom is sand, and below that, a kind of limestone. The isles form several small harbors, where water and other refreshments may be had, but are seldom frequented by any other than the people of New Providence. At the Berry Islands the tide rises two feet more when the sun is to the northward of the equator, than it does when to the southward of it. In the anchorage, or little harbor of these islands, the tide runs with strength among the rocks, in a N. W. direction.

‡ Orange Keys is a cluster of rocks and keys, lying near the west edge of the Great Bahama Bank, extending from latitude 24° 53′ to 24° 58′ N., and longtiude 79° 6′ W. The main rock is about three-quarters of a mile in length, and the broadest part about 120 yards, highest part 20 feet, and narrowest 8 yards. It is a barren rock, the eastern side quite straight, and runs S. S. W. and N. N. E. S. by W. of the main island, distant three-quarters of a mile, are two rocks, 6 feet out of water, about 15 feet in length; and one half a mile S. by W. of these, lie two smaller rocks. It is dangerous to pass between either of these rocks and the principal island, as reefs run out and connect

Keys, or continue on your course to latitude 24° 45′, when you may keep down west, and leave the bank without danger. In case you should prefer to haul to sooner than directed, in crossing the bank, and find your water shoaling, you may, by keeping off W., 3 leagues or more, find the deep water of the channel, which is 5 leagues in breadth; bear up as soon as you get but 2¼ fathoms, as it shoals suddenly and irregularly from that depth.

You may even run 7 leagues on your W. S. W. course, after leaving Stirrup Key, without danger; be careful to allow for the tide. On the north side, the flood sets S. S. E. and ebb N. W., and as you draw on the bank, the force of the tide decreases, for when you have got 4 or 5 leagues on the bank, the tide is but a slight set. Or when Stirrup Key bears south, 5 miles distant, you may steer S. W. by W. 44 miles, and then S. S. W. until off the bank. The water in the regular channel is milky white, to the eastward you have it clear with black spots on the bottom, and to the westward clear with hard white bottom.

By crossing the bank as above directed, you will see few or no spots of sponge, and the bottom is with difficulty discerned, and may be sure of three fathoms all the way.

Be careful of Orange Keys in the night-time, as they are very low, and cannot be seen until on board of them, and the soundings are deepened regular, until very near them on their east side.

S. W. from Orange Keys, 5 or 6 miles distant, is good anchorage in 20 fathoms water. When up with these keys, a passage is secured through the Gulf, for then you may make sail either in the morning or at midnight, steering S. W. 10 or 11 leagues, that will enable you to fall in with Salt Key Bank, which for 10 leagues on the north side stretches E. and W., and consequently the current sets stronger as you come to the westward. In coming over you have good soundings all along by it. There is anchorage by spots all the way in, but the soundings are narrow at the Double-headed Shot, the N. W. point of which lies in latitude 23° 52′ N. This route, however, demands the most zealous care, in order to avoid any shoal which may exist, although unknown. North 4° W., four miles distant from Orange Keys is the Galeon Shoal, having only twelve feet.

The edge of soundings, between the * Ridings Rocks and Orange Keys, is clean; you may enter on it without other care than that of the lead. From Orange Keys, which are

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them, 30 or 40 yards broad, and soon as over 4 fathoms. One mile south of these rocks, you may sail with safety. They are a mass of solid rock, and may be approached at the westward to their very edge, on 11 feet water. N. W. of them is good anchorage in 8½ fathoms, foul; there is, also, good anchorage S. E. of Orange Keys, in 6 fathoms, without other danger than the eye announces. To the northward it is not safe to approach within three miles, as the water breaks, and has a ridge, projecting to a very considerable extent. There is no sign of verdure on these keys, but round them plenty of fish.

Many persons mistake Orange Keys for the Riding Rocks, north of which you cannot go; but north from Orange Keys, 3 miles distant, you will find a passage, although it is not safe for strangers to go this way, neither should it be atttempted by any one, as you are obliged to pick your way through black patches, which are sometimes shoal. Var. 4° 26′ E., 1820.

* Riding Rocks lie 6 leagues north of Orange Keys, consisting of one rock or key, about half a mile long, and 12 yards wide in the broadest part, which is nearly divided one-third from its south point by a bay. This key is very irregular in its height, and more uneven than Orange Keys; about 2½ miles to the northward of this rock, is a small island about 2½ miles long, and 250 or 300 yards broad in the broadest part. To the northward of the southernmost key lie three small rocks, about 10 or 12 yards long, each running N. W. by N. The southern key runs N. by W.—the one next to this key is 50 yards from it: this, 100 yards from the third, and the third 100 yards from the second. These rocks are about 3 or 4 feet high. South of this key are two haycock rocks, just out of water, 6 or 8 yards from the land. There are also two rocks which lie half a mile east of the southernmost key, the largest 80 feet long, and the smallest 50 feet long, about one hundred feet asunder, and 12 feet high. These two rocks lie N. and S. There is a rock as big as a small boat about half a mile to the northward of these two rocks. A reef extends all along between these rocks, with the southernmost of the Riding Rocks bearing N. N. W., distant 1½ mile, 5 fathoms. Eastern Rock and the northern key, in a line bearing N. by W. 2½ miles, 4½ fathoms fine level sandy bottom; 2¾ fathoms immediately, and 3 miles distant, 3 fathoms. Northern Riding Rocks bearing W. 5 miles, 3¼ fathoms. Southern Key, bearing S. W. by W. 2 miles, 3½ fathoms. Main or Northern Key bearing W. N. W. 2½ miles, 3 fathoms. There is a shoal runs out from this key in a N. N. E. direction, on which are 6 feet water. You will not have a passage to the northward of the Riding Rocks for vessels drawing 6 feet water. Ebb sets N. E. 1½ mile per hour. S. by E. 1½ mile from the east lump of the Riding Rocks, there is a sizeable isle, with various small keys in its vicinity, called Rock Key; there is good anchorage on its west part, in 7½ and 8 fathoms, sand; and the edge of soundings lies 1½ mile off.

In steering from the Orange Keys to the Riding Rocks, the deepest soundings are 8½, and the shoalest 4½ fathoms. The western edge of the bank is an iron bound shore, being connected by one grand chain of rocks, extending under water from key to key.

Extract from the Orbit's log-book.—"Laying at anchor, among these shoals, at low water had 12 feet, and at high water 13 feet; had a light wind at W. S. W., and could see the edge of soundings off deck, not more than three-quarters of a mile distant: got under way at first ebb, and in

the southernmost keys on this side of the bank, the edge of soundings runs about S. by E. very clean to 24° 10′, and more or less deep; it forms, with the keys on Salt Key Bank, a channel, which is bottomless, and called Santaren. The above observation, in entering on to the bank between Orange Keys and Riding Rocks, means only the edge; as you get further on, you find the soundings obstructed in their regularity by many coral shoals, but by day, and with a free wind, you can pick your way.

In star-light nights the bank reflects a bright light into the air, which may be seen at 4 or 5 leagues. You may observe this reflection all over both the Bahama Banks, but not on Salt Key Bank: neither can you see it while on the bank; but when in the Gulf, you can plainly distinguish the Providence Channel, having none of this reflection between the two reflections of the Great and Little Bahama Banks.

An experienced navigator (the late Capt. Parke, of New York) while crossing the Bahama Bank, made the following remarks, which we know are entitled to full credit; "Having been three days detained by light S. W. winds and calm weather on my last passage across the bank, I made the following observations on the tide, viz.: the flood tide sets south, veering to S. W. and the ebb north, veering to N. E. For three days in succession the tide set nearly two knots in each direction, and very regular. On the third day, the weather being still and calm, I weighed anchor and drifted with the tide south, S. S. W. and S. W. When the vessel stopped drifting, I anchored in 3 fathoms water, and rode the ebb: when the tide slacked, I again measured the depth of the water in the same place, and found 15 feet."

It is not presumed the same depth of water can always be carried over the bank, even in the same track, as it must occur to the mind of every person that a strong easterly wind will drive the water off the bank, as well as a strong northerly increase its quantity; in all parts of the channel the bottom is of a sticky quality, whereas to windward the bottom is hard, and spots thicken as you shoal your water. Almost every regular trader has a dfferent course to run across the bank, but the principal object is to clear * Sheep Key Shoals; with the wind scant, and not drawing a heavy draft of water, you should haul to a little sooner, but not without a leadsman constantly in the chains, and should bear up as soon as you shoalen your water to 2¼ fathoms. With the wind steady and free, so that you could lay to windward of south, you should always make sure of westing to clear the shoals to windward, taking care not to run so far as to get among the shoals which stretch off from the east side of the keys which border the bank on its western edge.

There were scarcely two men who crossed the Bahama Bank that agreed as to the latitude of the Orange Keys, and many doubted their existence; this difference of opinion induced sending the sloop Orbit: the subject is now at rest, as marine and land surveys have been made by her officers, of the Orange Keys, Riding Rocks, Cat Keys, Great and Little Isaac, with the rocks, &c. adjoining, all which are previously described.

On the Bahama Bank, in lat. 24° 10′ to latitude 24° 20′ it is shoal near the edge. The tide rises 6 feet, and there are many spots in this space with less than 10 feet at low water. The shoal lies within one mile of the edge of the bank: they are of quicksand, and of course the depth of water on them must alter with every gale.

Should you prefer running down the Cuba shore, you may steer S. W. after leaving the bank in latitude 24° 40′, and when sure of having passed the Double-headed Shot, haul a little more southerly, say S. W. by S., and make the Island of Cuba; this is called the route by the Santaren Channel, and is at all times preferable. Keep down in shore as far as the table land of Mariel, which cannot be mistaken, when you may run over N. W., and if not more than 24 hours in the Gulf, you will clear the Tortugas; but if you are a longer time in crossing, it would be prudent to keep a look out for colored water and the Tortugas. The Pan of Matanzas bearing S. S. W. to S. appears like one round hill, but at any other bearing you will see another each side of it not so high, and adjoining to it. If you are near in shore, on passing the Havana, you will see the shipping in the harbor, and the Moro Castle light may be seen 8 leagues off. The table of Mariel is 9 leagues from the Havana.

When you anchor on any part of the edge of the bank, in order to pass the night, or

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making a tack crossed over some shoals with only 13 feet water on them, on which there could not be more than 7 or 8 feet at low water; and I have no doubt, but, at times, after heavy gales, these shoals may be above the water's edge.

"High water, at full and change, on the edges of the bank, at 8h. 50m. On the north side the rise is 2 feet; on the west, to the northward of Orange Keys, 3 feet; to the southward of Orange Keys, 4 feet, and in lat. 24° 10′, 5 and 6 feet. The flood and ebb set from three-quarters of a mile to two miles, on and off the bank."

* Sheep Keys bear S. S. W. ½ W. 7 or 8 leagues from Stirrup Key, and lie off the N. N. W. part of Andros Islands; from these keys it is, as before observed, very foul to the westward, and the shoal extends quite round to Stirrup Key; the bottom covered with spots of sponge and rocks, the size of a barrel or the head of a hogshead; and any object on the bottom may as plainly be seen as if no water intervened. Here the tide rises 4 feet.

for a favorable tide, you ought to have every thing ready to make sail the moment it may be necessary; and also, if the sky looks ill, you should have the topsails reefed. From any one of these anchorages you may make sail with any wind; and, generally speaking, every one in these parts, who requires to anchor, may find a proper place to do so, and in which he may be sheltered from the winds that molest him, or which he foresees coming; and without eddy winds to leeward, which cause trouble in case of fouling the anchor, though they only require vigilance and a seaman-like dexterity.

On leaving the bank, you must be careful not to fall in with the Florida Shore, or Double-headed Shot Keys, in the night time; but with day-light and a breeze, there is no danger in making either.

High water, at full and change, on the edges of the bank, at 8h. and 50m.; on the north side it rises two feet; on the west, to the northward of Orange Keys, three feet; to the southward of Orange Keys, four feet; and in lat. 24° 10′, it rises five and six feet. The flood and ebb set from three-quarters to two knots on and off the bank.

PROVIDENCE N. W. CHANNEL, AND N. W. EDGE OF THE GREAT BAHAMA BANK.—As vessels drawing over 13 feet water cannot cross the Great Bahama Bank, from the Berry Islands to the Orange Keys, it is necessary to navigate along the edge to the north of the Isaacs, and, doubling them, go as far south as the Orange Keys; the best course is, when up with the Hole-in-the-wall, to steer W. by N., 36 leagues, which will carry you to the west edge of the bank, and about 2¾ leagues from the Great Isaac, taking care to keep in 12 or 16 fathoms, in which you ought to pass 2 miles from the Great Isaac; then shape your course through the Gulf, exercising the utmost care so as not to get far out from the edge of soundings, because the moment you leave the edge, and get into blue water, you will be in the general current, or Gulf Stream, which sets strongly to the northward; therefore, if the wind does not permit steering along the edge of the bank, you ought to anchor on it, and wait till the wind be favorable. He who has no experience in this place, ought not to pass beyond the Great Isaac by night, but may anchor to the N. E. of the centre of the island, in from 7 to 10 fathoms, on sand, and wait for day-light.

To run along the edge of these banks, you have to attend to the lead, and keep an unusually strict lookout, as the Gingerbread Ground, in the neighborhood of the Little Isaac, makes up at once from deep water, with which guide, and the notice we have given, you will have sufficient information to enable you to avoid all danger. On the edge of soundings, although you do not feel the general current, yet there is a set of the tide, which may either run a vessel off the edge, or upon the keys; but this cannot happen if the lead, which ought to be kept constantly going, is properly attended to, as it will warn whether to keep to starboard or larboard, in order to preserve the proper depth. In this passage you will pass * Little Isaac, † Great Isaac, ‡ Bemini Isles, and Gun Key light.

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* Little Isaac consists of three islands or rocks, running in an E. S. E. direction: the western rock is about 40 feet in length; the eastern rock rather larger, about 5 miles from the western one. Between these two, in a direct line, is a smaller rock, about one mile distant from the eastern Isaac, on the same line: they lie about 5 or 6 miles in on the bank: outside of them the soundings are clean; you will have 14 fathoms on the edge, diminishing gradually, so that one mile from them you have 6 fathoms. In all the distance between Stirrup Key and Little Isaac, the edge is clean, and you may navigate down it by the hand lead. S. E. from the Little Isaac you may anchor, good holding ground, but a heavy sea. The shoal ground on which these rocks exist is called the Gingerbread Ground: it extends 5 leagues E. by S. from the western rock, and has some dangerous rocky heads upon it, with only 7 to 9 feet water. Under the S. W. end of the Gingerbread Ground, within the Little Isaac, you may anchor in 3½ and 4 fathoms. The holding ground is good, but there is often much sea. There is also good anchorage in 8 and 9 fathoms off the east end of the Gingerbread Ground, at 12½ leagues to the westward of Little Stirrup Key, which may be found useful during a northerly wind.

† Great Isaac is a key of moderate height, about half a league in extent from east to west, in lat. 26° 1′, long. 79° 2′, and bears about W. N. W. from Little Isaac, distant 5¾ leagues. A cluster of little islets and rocks, called the Hen and Chickens, lies at the distance of two miles to the S. S. W. of its western point. There is also a round rock, about 20 yards broad, at the distance of two miles N. E. by N. from the N. E. point, and a reef called the Brothers, at the distance of a league to the east from the east point. The ground in other parts is clear, and to the N. W. and S. W. of the isle is good and extensive anchoring ground, with regular soundings from 15 to 5 fathoms, with soft limestone bottom and broken shells. The Brothers are two haycock rocks, lying W. S. W. and E. N. E., 1½ mile distant, the easternmost being about 5 miles from the Great Isaac. The Hen and Chickens have good anchorage on the west side of them in 5½ or 6 fathoms of water, fine sand. The bank of soundings extends 6 miles to the west of the Great Isaac, with increasing depths, from 7 to 16 fathoms; and to the S. W. nearly 6 leagues, with 7, 6, 7, 6, 10, and 17 fathoms, and from the Great Isaac to Bemini Islands, the soundings are 9, 9, 8, 7, 7½, 8, 8, 8 fathoms. On the bank you can anchor, the Great Isaac bearing S. E., in 8, 5, and 10 fathoms. Near the Great Isaac, at the N. W. extremity of the Providence Channel, the current runs to the E. at the rate of 2 miles an hour.

Too much caution cannot be used between the Great Isaac and the Bemini Isles, as there are

GUN KEY LIGHT.—At 250 yards from the southern extreme of Gun Key (a narrow ridge of coral, which stands on the western edge of the Great Bahama Bank) a lighthouse has been erected, in 25° 34′ 30″ north latitude, and 79° 18′ 24″ west longitude. Its base is 25 feet above high water, and the height of the tower is 55 feet. The light revolves once in every minute, and may be seen in all directions, except between the bearings of S. by W. ½ W., and S. ¾ E., (magnetic,) where, at the distance of about 8 miles, it will be intercepted by the Bemini Islands.

When within 5 miles distance, vessels should not bring the light to the southward of the S. E., as the chain of keys and reefs project in a curve to the westward, and as they lie within a mile of the outer edge of the bank, there might be scarcely time to obtain soundings. The flood tide also sets strongly to the eastward through the intervals of the keys, where it is high water, at full and change, at 7h. 30m., and the tide rises three feet.

The light being 80 feet above the level of the sea, it will be visible in clear weather at the distances of 12 miles to an eye elevated 10 feet.

13.....20 do.
15.....40 do.
17.....80 do.

From Orange Keys you may leave the bank and enter the Gulf, without dread of the current, steering as before directed for the Double-headed Shot Keys. Or you may from the Riding Rocks steer for the Salt Key Bank, navigating along its edge, and, as it were, having doubled the western angle, steer for the coast of Cuba; but to do this, it is necessary to steer from the Riding Rocks S. S. W., and sail more than 4 miles the hour, and as one is not master of the winds, if it should be calm, you will be in danger of drifting to the north, a thing you should by all means guard against, on which account we consider the navigation by the Santaren Channel as preferable.

This navigation, which we have just described, is not in common practised by those bound from Europe to Havana, or to the Gulf of Mexico, as it offers no advantage over that of the old channel, or that to the south of Cuba, which is more direct; but it may be well for vessels from the United States, and for those who, driven out of the Bahama Channel, by calms or accident, wish to avoid the long circuit of gaining sufficient east longitude to make Point Maysi and return to Havana by the old channel.

SOUTHERN BORDER OF GREAT BAHAMA BANK.—Key Verde is the south-easternmost key of the Great Bahama Bank, in lat. 22°. It is only a mile and a half in length, and about two cables' length broad, extending E. S. E. and W. N. W., and is destitute of fresh water. From this key the edge of the bank extends W. S. W.,

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several rocks under water. The shoal on which the British brig Moselle struck is the most dangerous, and the bearings of the land from the spot were as follows:

The N. E. point of Bemini Isles, S. S. E. ½ E., 5 or 6 miles. The southernmost part in sight, S. by W. ½ W. The ground water rock, (which appears above water, and lies to the northward of Bemini,) S. E. ¼ S., 1½ mile distant.

This reef is upwards of a mile in length, and about 60 feet wide. It lies in a S. by W. and N. by E. direction, and has 3 and 4 fathoms close to it on both sides. In some spots there are not more than 10 feet at high water, the tide rising and falling between 3 and 4 feet; flood setting to the N. E. and ebb to the S. W., forming a rippling like the meeting of two currents. Position, when aground, latitude 25° 46′ N., longitude 79° 19′ W. De Mayne places the rock in 25° 50′ N., and longitude 79° 15′ W.

The flood here sets at the rate of about 1½, and the ebb 3 miles an hour.

‡ The Bemini Isles are low, with some small trees, or rather bushes on them, particularly on the S. E. part of the South Isle. They are the westernmost isles of the Great Bank, and lie in latitude 25° 44′ N., longitude 79° 4′ W. Under the south point there is a bay, with some low keys lying S. S. E. and S. E. of it, in which you can anchor and have shelter from winds at N. round to S. E., with 4½, 5, and 6 fathoms, or you can pass the night here when bound southward. On these keys and islands there is some wood and water.

These islands are represented from a plan made by the officers of the British brig Moselle, in July, 1810, which exhibits a shoal on the south side of the Southern Bemini, as having only 3 feet of water, white sand and sponge. On the edge of the bank, south of the S. W. point of the same isle, there are no soundings within a cable's length of the rocks; but westward of the same point is the anchorage above described, extending outward about one league; and the edge of the bank thence continues in a N. N. E. direction, but having within it similar soundings to the distance of 5 leagues. Beyond this is a dry rock, and a ledge on which the Moselle grounded.

The inlet, or harbor, between the Beminis, has throughout from 12 and 11 to 10 and 9 feet at low water.

From the S. W. point of the Southern Bemini, a chain of low keys and rocks, called the Turtle Rocks, extend about 3 miles to the south. Some of them do not rise to the level of the water. Here the bank is very steep, as, at the distance of a pistol shot, no bottom is to be found, and, at the half length of a ship, are 14 and 15 fathoms, on sand. Barnett's Harbor, a hole in the bank, of 2½ fathoms, divides this from a succeeding group of keys, called the Cat Keys, which extend to the south nearly to 25° 30′ N.

11 leagues, to the Key of St. Domingo, in the mouth of the Bahama Channel. The ground between Key Verde and St. Domingo's Key is generally clean; but there are two shoals: one at 13 miles from Key Verde, on the edge of the bank, is called St. Vincent's, and does not exceed a cable's length in extent from N. N. W. to S. S. E., by half a cable at its greatest breadth, with only 3 feet over it; the second shoal is also on the edge of the bank, 9 miles from St. Vincent's, and 22 from Key Verde: it is formed of rocks, is not so large as the former, and has one fathom over it.

The Key of St. Domingo is arid: it is a cable's length long, and half a one broad, and its middle forms a small hill, covered with the Indian fish-bush, which looks like an upset vessel, and may be seen at the distance of three leagues. A breaker extends from the S. S. W. side to the distance of three leagues; and W. by S. from its middle, at the distance of two or three cables, there is a bank of 6 and 7 fathoms, with very clear water, where shelter from the breezes may be found.

On the southern part of the bank, to the westward of the Key of St. Domingo, there is no particular object which is not sufficiently described. The only spots above water are the two keys called Lobos and Guincho, or Wolf and Ginger Keys, both of which have foul ground about them, from north round by east to south, so that, in these directions, they should not be approached nearer than a mile. Both may be seen at the distance of 6 or 8 miles. The shoal grounds named the Mucaras, which are about 20 miles to the south-eastward of Lobos, have weeds or grass at the bottom, and it is, therefore, requisite to notice that the water on them remains as dark colored as in the mid-channel. Without them are no soundings, and they should, therefore, be approached with great caution, for without this a vessel may easily be lost, even in day-light. On the very edge of the bank, between Lobos and Guincho, there are some other shoal spots; and vessels of great draught should not venture upon the bank. There are, likewise, some rocky spots to the westward of Guincho, so that caution here is also required.

ANGUILA, OR SALT KEY BANK.—This bank lies opposite the western end of the Old Channel of Bahama, between the Great Bank of Bahama and the Island of Cuba, and forms the channels of Santaren and St. Nicholas, the former on its N. E., and the latter on its south side.

At the north-western extremity of the Salt Key Bank, on the elbow, or north-westernmost and highest of the narrow ridge of detatched barren rocks, commonly known as the Double-headed Shot Keys, a light-house has been erected in 25° 56′ 23″ N. latitude, and 80° 27′ 38″ W. longitude.

Its base is 46 feet above high water, and the height of the tower is 54 feet.

The light is fixed, and may be seen in all directions, except on the bearing of S. W. by W. ½ W., (magnetic,) when, at the distance of about 9 miles, it will be interrupted by Water Key.

From the light-house, the south-westernmost of the Double-headed Shot Keys bears S. S. W. ½ W., (magnetic,) distant 3½ miles.

The Florida Stream is generally found to set strongly to the N. E., within a mile and a half of these rocks, but through the intervals of the keys, the ebb and flood tides run rapidly off and on the bank; when it is high water, at full and change, at 9 o'clock, the tide rises from 2 to 3 feet.

The light being 100 feet above the level of the sea, it will be visible in clear weather at the distances of 14 miles to an eye elevated 10 feet.

15¼	"	"	"	20	"
17½	"	"	"	40	"
29	"	"	"	80	"

The following description of this bank is by Mr. De Mayne, who surveyed it in 1825:

"Its greatest extent is from N. W. to S. E., about 20⅔ leagues, and the broadest part is about 12 leagues. Its western edge is bounded by a chain of barren rocks, called the Double-headed Shot Keys, the north-westernmost of which, called Elbow Key, lies in latitude 23° 55′ N., and longitude 80° 25′ 30″ W. From this point they extend to the N. E. by E., in rather a circular direction, 9 miles to Water Key, which is the largest of this chain, being nearly 2 miles in length, and about half a mile broad. Near the centre of this key, and close to a good boat landing-place, on the south side, is a natural well of fresh water, formed by a hole in the rock.

"Opposite Water Key, as well as all these chains of rocks, on the south, or bank side, there is good anchorage, in 5 or 6 fathoms water, at any distance from them, and good holding ground; and from these rocks being so closely connected, they form a complete breakwater against the winds from the W., N. W., N., and N. E. quarters, which sometimes blow with great violence, particularly in the months of February and March. The wind from any other quarter seldom blows stronger than what may be termed a brisk gale.

"From abreast of Water Key, the bank trends to E. N. E. about 8 or 9 leagues, and thence S. E. by S. to the Anguila Islands, a distance of about 13½ leagues. In this space, there are several clusters of rocks, rugged and barren, some of which are very lit-

tle above the sea, situated at about 4 miles within the edge of the bank, forming channels or passages to the bank, which appear safe to sail through. They are distant from each other from 1 to 10 miles. On examining the four westernmost of these passages, there was not found less than 5 fathoms water; the bottom very rocky, until you get well on the bank. Ships should be cautious not to approach too near these clusters of rocks; the deepest water will be found by keeping as near mid-channel as possible.

"The Anguila Islands are situated on the south-eastern extremity of the bank: they are so closely connected, that they may be said to form but one island, about 8 miles in length, and three-quarters in breadth, and can be seen 4 leagues off. They are covered with brush-wood, but afford no fresh water: on the N. E. side the approach is dangerous; but on the S. W. side there is good anchorage, in 5 or 6 fathoms water, sheltered from N. to S. E. winds.

"The S. E. extremity of the Anguila Islands appears in latitude 23° 29′ 40″ N., and longitue 79° 27′ 40″ W. The north-westernmost of the Dog Rocks, in latitude 24° 4′ 10″, and longitude 79° 50′ W. A dangerous shoal is represented near the eastern edge of the bank, in latitude 23° 46⅓′; but this, with the various keys near the edge, and rocky heads in the interior of the bank, will be best understood by inspecting the chart.

"Key Sal is situated near the S. W. extremity of the bank, and distant from the Elbow Key of the Double-headed Shots about 4¼ leagues. This island is of a triangular shape, and about 1½ mile in length, having an excellent salt pond in its centre, the produce of which is of the finest quality. The centre of this key is in latitude 23° 42′ N., and longitude 80° 20½′ W. Nearly east from Key Sal, distant 2¼ miles, is a small shoal, even with the water's edge, called Lavanderas; and in a north-west direction from the same key, about 4 miles, is another small shoal, also even with the water's edge. Both these dangers can be seen at all times, in the day, at a sufficient distance to avoid them.

"The general depths on the interior of the bank, those on the rocky heads excepted, are from 4 to 5, 6, and 7 fathoms.

"The tides on the west part of the bank, being much influenced by the Gulf Stream, run in various directions. The flood sets strong through all the openings, or between the rocks, towards the centre of the bank, and the ebb contrary. It is high water, on full and change days, at Anguila Island, at three-quarters after 8, and at Water Island at 9 o'clock. Spring tides generally rise 3 feet 4 inches, neaps 2 feet 3 inches; but much depends on the wind."

The Derrotero says, Key Sal may be discovered at the distance of 10 miles, and fresh water may be procured on it with facility, although there is not any on Anguila, or the other keys in its vicinity. This bank has three rocky shoals upon it, as shown in the charts; but vessels may navigate upon it without danger in 7½, 8, and 9 fathoms water, in all the months from October to May. Whenever the appearance of the sky indicates a hard north, it is advisable to enter on the bank, and anchor under the shelter of the keys; or you may lie to there, being careful only to make use of the lead, until the wind changes, so as to enable you to proceed.

The current does not always set through Nicholas Channel to the westward, but a regular tide of ebb and flood prevails throughout; the flood setting eastward, and the ebb westward, at the rate of about one mile in an hour.

In the Santaren Channel, between the Great Bank of Bahama and the Salt Key Bank, there is said to be rarely any current, unless after heavy gales, when it runs with great violence up and down. If it predominates in one direction more than another, it is to the N. N. W., and about one mile an hour.

Description of the Southern and Eastern Coasts of East Florida.

TORTUGAS ISLANDS.—On the southern edge of soundings, which extend off the western coast of the promontory or peninsula of East Florida, are 10 or 11 keys or small islands, called the Tortugas Islands, which is the westernmost land, and which announces the proximity of the General Florida Reef, which terminates the southern edge of soundings, and which continues to the east, doubling the above mentioned promontory, and extends to Cape Florida.

The Tortugas (often called the Dry Tortugas) are generally looked upon to be very dangerous, and to a person unacquainted with them, they undoubtedly are so, especially in the night time; yet, when they are known, on many occasions, they may be found both useful and convenient. They extend east and west 9 miles, and north and south 6 miles, and, although very low, can be seen at the distance of 12 miles, being covered with bushes: you should not come nearer them than 2 miles, as they have some rocky spits which extend that distance from them.

To the west there is a large bank of coral rocks, intermixed with white patches of sand, on which the soundings are irregular; but as the bottom shows itself very plainly, there is no danger. This bank is of an oblong form, and between it and the Tortugas Islands there is a clear channel of three miles wide, with soundings from 13 to 17 fathoms water.

The Tortugas are situated N. 14° W., true, about 30 leagues from the nearest part of Cuba, the table land of Mariel, and 14 leagues from the westernmost of the Florida Keys. The S. W. key, which, though one of the smallest, is the most material to be known, lies, according to Gauldt, in lat. 24° 32′ 30″. A reef of coral rocks runs off it S. W. a quarter of a mile, on which the water is discolored.

If you are bound to the eastward, and meet with a strong easterly gale, which is frequent there in the summer season, you may safely come to an anchor in 5 or 6 fathoms, about a quarter of a mile off shore under the lee of the long sandy island to the northward of the South-west Key. There is a good anchorage also in several other places, particularly in a small but snug harbor, near * Bush Key, which is entirely sheltered from the sea by a large reef of rocks, and a flat shoal within them, about half a mile broad; the bottom is soft clay and mud. This harbor is quite smooth, even in a gale of wind, and in case of necessity a vessel might easily be hove down there, as there are 3 fathoms water close to the bank. There is no drinkable water to be got on any of the Tortugas, except on the northernmost island; nor is there any fire wood, except a few bushes, which it were a pity to cut down, as they serve to distinguish the keys at a distance; but the Tortugas abound with variety of sea birds, turtle, and excellent fish. There is a broad channel to the eastward of the Tortugas, from 10 to 17 fathoms depth, but it is by no means advisable to be attempted, unless you can see the Tortugas distinctly, and keep within 2 or 3 leagues of the easternmost island, as there is a coral bank of 12 feet water at the distance of 5 leagues; and further eastward towards Cayo Marquese, a very dangerous and extensive bank of quicksand, on every part of which you have no more than 4 or 5 feet water. It is of a remarkable white color, especially all along the north edge, and may easily be seen and avoided in the day time.

The tide between the Tortugas and Cayo Marquese sets variably through the northward, and ebbs to the E. S. E. about 3 or 3½ feet by the shore.

Eighteen miles to the eastward of the eastern Tortugas, the General Florida Reef begins, between which there is a good channel of 9 fathoms water; but you must take care of a coral reef of 12 feet, which lies 11 miles from the Tortugas, on which the ship Rebecca, of New York, lost part of her cargo in 1820. To go through this channel, you must keep the easternmost Tortuga in sight off deck, so as to pass at 2 or 3 leagues from them.

The proximity of the Florida Reef is shown clearly in the day time by the whiteness of the water, so that there can be no danger in drawing in with it; but if safe by day, it is not so by night, nor in bad weather, when you should carefully avoid it, and be sure to keep the lead going, by which means you can avoid danger at the distance of two miles from the edges of the keys or reefs.

In passing the promontory of Florida it is not this reef alone which you see, but an innumerable quantity of keys and islands, raised upon a bank north of it.

BANKS AND COAST OF FLORIDA.—Twenty miles to the eastward of the easternmost Tortuga, is placed the west edge of the bank, called the Marques Bank, and 13 miles farther east are placed, on this bank, the key called Marques Key, which is the westernmost of a group, of which the northernmost is called Boca Grande Key; this key is the largest of the group, and is near six miles east and west. About one mile to the eastward of this key the first bank ends, whose eastern edge runs about north and south. The first bank is separated from the following by a channel of two miles wide, with 10 or 12 feet water, sandy bottom. This channel is called Boca Grande, but no man who is not well acquainted, should ever attempt to take the channel, as there are some shoals in it.

The second bank, called the Mangrove Islands, is like the first, upon which is raised a portion of islands, of which the three southernmost have white sandy beaches. This second bank may be viewed as distinct from the following, although they are united on their northern part by an isthmus of half a mile wide; otherwise they are separated by a channel of 1 mile in breadth, which contains from 10 feet to 12 fathoms water, low tide.

The third bank is that of † Key West and the Pine Islands, at the western part of which it is called by the former, and at the eastern by the latter name.

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* On Bush Key (Garden Key) one of the Dry Tortugas, is a light-house elevated 70 feet above the level of the sea, showing a fixed light, and can be seen *when a vessel is on shore*, and is without doubt the worst kept light on the coast. It can be approached within 3 miles on the west and east sides, but on the S. W. you should keep at the distance of 6 miles.

† A light-house is built on Key West, containing a fixed light, and a number of buoys are placed, viz.:

A white buoy, showing 3 feet above the water, and on the reef, in 26 feet water, bearing from the light-house on Whitehead Point S. S. E., and from the light-house on Sand Key, E. by N. ½ N.

A white buoy, showing 3 feet above water, moored in 27 or 28 feet, and bearing S. S. W. ½ W. from the light-house on Whitehead Point, [Key West,] near the dry rocks which lie to the west of Sand Key, to show the west channel into Key West.

The first island on its western edge, is Key West, which lies E. by N. and W. by S. 6 miles in length, N. and S. 2 miles in breadth, and about 56 miles from the main land of Florida, and its southern coast is very sandy. This island is covered with trees, especially on its western part, in which there is a secure anchorage, with a channel of 4½ fathoms to enter it, and 2½ fathoms within, well sheltered. To enter this channel you must observe the following directions, viz.:—In running along the Gulf Stream you must not attempt to pass the reef, which is about six miles from the island, until you bring Whitehead Point light-house, which is on the S. W. point of the island, and which exhibits a fixed light, to bear N. N. W.; then steer for the harbor, which lies at the N. W. point, leaving * Sand Key light-house, which exhibits a revolving light, on your larboard hand, as you cross the reef, and taking care to give Whitehead Point a berth of one mile on account of a reef that makes off from it. The light-house on Sand Key bears from Key West light-house S. S. W., nine miles distant. After you pass the reef (at the inner edge of which a buoy has been placed, as before mentioned,) haul up for the flag-staff. You will have 3½ to 4 fathoms water crossing the reef, and then from 6 to 7 fathoms until you enter the harbor, where you may anchor with perfect safety. There is a powerful tide here, rising and falling about 4 to 5 feet, and setting alternately N. E. and S. W.

There is a passage through Key West from Florida Stream, into the Bay of Mexico, for vessels drawing 12 feet, at low water. This passage is about 6 miles in extent, and vessels by passing through it, save the danger and delay of going round the Dry Tortugas, which are a group of ten distinct islands or keys, lying off the west coast of East Florida, low, some covered with mangroves, surrounded with reefs and sand banks, extending N. E. and S. W. 10 or 11 miles, and from east to west 8 miles, and may be seen at the distance of 4 leagues. Good pilots can be obtained at Key West to carry vessels through. The harbor is large and commodious, admitting vessels of the largest class, where they are protected from all winds within 200 yards of the N. W. point of the island, and several ponds of fresh water, which for nine months in the year produce excellent water.

From Key West eastward for 24 miles, there are nothing but low mangrove islands, in whose channels nothing but canoes can pass. This third bank terminates at † Bahia Honda, and the islands to the eastward are somewhat larger, and covered with pine trees, but are low and drowned like the others, and their channels are navigable only for boats. Of the whole of these islands there is but one, which is 13 miles from Key West, which, although small, is of tolerable height, is rough and covered with trees, and in whatever direction you see it, appears in the form of a saddle.

The next bank is called Bahia Honda, separated from the last by a channel of half a mile wide, which channel is called Bahia Honda, and in which there is anchorage in 3 and 3½ fathoms. This channel is easily known, because on its western part, and on the very eastern part of the last bank of Key West and Pine Islands, there are three small islands, and on its eastern part, upon this fourth bank of Bahia Honda, there is one called Palm Island, which is large, and has a sandy beach, and is remarkable by the many high palm trees with which it is covered, and are the first you see coming from the westward. This bank of Bahia Honda has but few keys, and extends E., about four leagues.

From the fourth the fifth follows, called Key Vacas, or Cow Keys, extending to the eastward about 5 leagues, upon which bank a group called by the same name, is raised, the easternmost of which is called Dutch Key, or Cayo Holandes; between this key and Key Bivoras is one league. This key is remarkable by its white sandy beach, and by a tolerable high hill covered with trees, which is on its western part.

Concerning the whole of the channel to the westward of the Cow Keys, it may be necessary to state the following remarks, namely, that you will have three fathoms water all the way within a mile of the keys, and will always find the deepest water nearest to the reef. That the usual method navigating between the reef and the keys, is, to proceed in the day-time, and lie at anchor in the night; and that should you be obliged to anchor where there is any coral, it will sometimes be necessary to buoy up your cable to prevent its being rubbed.

From the eastern extreme of Key Bivoras to the westernmost part of Old Matecumbe, is 3½ miles. Old Matecumbe is 4 miles long in the direction of N. E. and S. W., and its N. E. point is covered by some very high trees, appearing like table-land. On the north end of Old Matecumbe is a natural well, in a rock, containing excellent water

One mile east of Old Matecumbe, lies Indian Key, to the eastward of which there is a channel running to the northward, with 10 and 12 feet water, where by doubling the N.

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* Sand Key light-house is erected off the coast of Florida, near Key West. The lantern is elevated 70 feet above the level of the sea, and shows a revolving light, which revolves once in 54 seconds.

† Off Bahia Honda a buoy is placed, in 27 feet water, bearing north, when Looe Key Beacon will bear W. S. W. ½ W.

E. point of Old Matecumbe, you may anchor, sheltered from all winds. This channel is easily discovered by the white shoals of only 2 or 3 feet, bordering both sides of it, which serve as an excellent beacon.

Two miles N. E. of Old Matecumbe you will find Little Matecumbe, which in this same direction has 4 miles in length: this key is covered with high trees. Off its N. E. part there is a small mangrove island, separated by a channel of half a mile wide, and N. E. of the last there is another, of tolerable size, separated by another channel of the same breadth. This is also separated by another channel, like the others, from Long Island.

N. E. from Long Island lies * Key Largo, separated like the others by a small narrow channel. Nearly east from this channel, 1½ mile, lies Key Tavernier, to the northward of which there is excellent anchorage for vessels drawing not over 8 feet water, and is one of the anchorages much frequented by the fishermen. About N. E. by N. from Key Tavernier lies the Key Melchor Rodrigues, which is an island of tolerable extension, and the land so spongy that the roots of the trees are discovered.

The coast runs from Melchor Rodrigues to Key Largo. Off this key lies that most dangerous reef called Carysfort, (which appears like main land,) N. N. E., N. by E., and N., on which last course there are various keys for some distance, of which the last is called † Key Biscayno; a little to the northward of this key there is an island of moderate size, off the main land, the eastern point of which is called ‡ Cape Florida; from this cape to the northward, it is clear of keys and reefs, and is all low and drowned. The shores of this coast are lined with a bank of regular soundings, which run off a good distance; this regularity of soundings extends from Cape Florida to Cape Canaveral, and is of great benefit to navigators, except in about the latitude of 26° 30′ N., where the soundings narrow, and scarcely extend two miles from the coast. The soundings off Cape Canaveral, that cape bearing W. by S., are 55, 75, and 90 fathoms, at 32, 36, and 39 miles distance. (Lieut. J. Paine, April, 1839.) From 26° 30′ the soundings widen from the coast, and the whole is very clean, with the exception of Cape Canaveral, from which, at a long distance, you will find upon the same soundings various shoals; but as the soundings run farther out to sea than these shoals, he who navigates here must run with care, and have his lead at hand.

From Cape Canaveral the coast runs N. W. by N. 26 leagues, to the entrance of New Smyrna, which is barred, and only fit for boats and launches; the coast is very clean, and you may, without danger, keep within two miles of it.

Seven leagues N. 25° W. from New Smyrna, is the entrance of Matanzas, but only vessels of very light draft can enter it: this bar has 8 feet, at high water. From this entrance there is an island navigation to St. Augustine, formed by the island of St. Anastasia and the main. The tide rises 4 feet at spring tides, and it is high water at full and change at 7 h. 15 m. The whole of this piece of coast is equally clean with the anterior. You have 8 fathoms one league from the land.

From Matanzas to St. Augustine is 12 miles, and the Island of St. Anastasia extends the whole length; you may keep along it at two miles distant, in 5 and 6 fathoms. You can see this island from 15 fathoms, as it is pretty high, and also distinguished by the light-house, showing a fixed light; the coast to the northward is very low, and you can see it but a short distance, so that it makes a good mark to know if you are north or south of St. Augustine.

From the foregoing observations it clearly appears that there can be no great difficulty in getting fresh water on most of the islands; and, except the Tortugas, there is plenty of fire-wood upon the whole of them. With respect to water, it may be observed that just within the sandy beach, the islands are generally bordered with mangrove swamps, of about 100 yards broad; beyond these swamps the ground rises higher, and is generally of a rocky bottom, where you will often find fresh water ponds, or natural tanks, which receive rain water.

SOUNDINGS OFF FLORIDA.

The whole of the coast from Cape St. Blas, as after mentioned, sends off a bank of soundings which stretches a long distance from the land, and these soundings are generally known by the name of Tortugas soundings, and are so clean that other danger is not known in the whole of it, than a spot or knoll of sand in lat. 28° 35′, and lies about 12 miles east of the meridian of St. Blas.§ This knoll has but 3 feet on it, and so steep

* A floating light is placed off Key Largo, bearing from the highest land on the key E. by S., distant 7 miles; from the elbow of Carysfort Reef, N. ½ E., distant 3 to 4 miles. The outer reef (say 14 fathoms water) bears E., distant 2½ miles. Lat. 25° 6′ N., long. 80° 28′ W.

† Key Biscayno lies a little to the southward of Cape Florida. On it is a light-house, the lantern elevated 70 feet above the level of the sea, and exhibits a fixed light.

‡ A white buoy, showing 3 feet above water, is placed on a reef near Cape Florida; Soldier's Key bears from it W. by N., and Saunder's Hat bears S. S. W.

§ It is extremely doubtful whether this knoll exists.

that from 100 fathoms you will be upon it, and is probably what was called in ancient charts Providence Island. The whole of these soundings are very equal, diminishing gradually towards the shore.

When you enter on these soundings, without a sure knowledge of the latitude, and in parallels near the Tortugas, it is necessary to run carefully to get soundings on its edge, and not get into less than 40 or 35 fathoms, which is a depth to keep clear of the Tortugas, which lie in 30 fathoms; that is, if they did not exist the regular soundings of the bank would be 30 fathoms where they are placed: on the western part of these keys the soundings are steep.

You should take the same precaution when entering on soundings in parallels north of the Tortugas. You should take this same precaution when navigating to the southward, that you may leave soundings with safety off its southern edge, so that what is said is sufficient to liberate you from all danger offered by the Tortugas.

On the edges of this bank the waters run lively to the southward, so that when navigating from the westward, with intention of sounding on its edge, the ship will be retarded by the wind, which fixes itself at E. N. E., or E.; but when for two days you experience a difference of latitude to the southward of 20 miles more than account, you may be sure that you are in the vicinity of soundings, in which case you may suppose yourself in the meridian of the edge, and calculate an error, if not exceeding 30 miles, and thence take your route with security.

FLORIDA REEF.—To the eastward of the Tortugas, and at the distance of 17 miles, the Florida Reef commences. Its breadth is about 3 miles, and it preserves the same, or nearly the same breadth, as far as the eastern meridian of Boca Grande, and thus far has, at least, 3 fathoms water over it. You can cross this portion of the reef with any ship of 16 feet draft; but you should ever remember, that over White Shoals you always endanger the ship if she is large, especially if the weather is thick, when the bottom does not show itself clearly. You may in such weather soon encounter a coral shoal of only one fathom, or even less; so that when we say, that the least water is 3 fathoms on this portion of the reef, it is because it is so generally, and that the inequalities found on the other parts of the same reef to the eastward, are not found here on this portion of it.

From the eastern meridian of Boca Grande the navigation is safe, till within 4½ miles of Sand Key, on which is a light-house, showing a revolving light, bearing S. S. W. from Key West light, distant 9 miles: 4 miles from Sand Key, W. ½ S., on the outer edge of the reef, lies a group of dry rocks, and N. E. by E. from these rocks, is another group of dry rocks, bearing N. from Sand Key, and between them, in the same direction, are two or three shoals with only 9 feet on them. One and a half mile east from Sand Key is another group of dry rocks, on a bank which extends 4 miles east from the Sand Key, on which there are from 2 to 3½ fathoms water. Six miles E. by N. ½ N. from Sand Key is a coral shoal, with 3 fathoms on it, between which and Sand Key lies the eastern channel into Key West. (See Index.) From this shoal the reef leads E. N. E., and is very dangerous, being full of coral rocks, on which there is as little as 10 feet water, till you come up with Looe Key, on which is a beacon with a red ball on the top. Off Looe Key the bank is very steep. Sixteen miles from Looe Key lies Sombrero, which is the easternmost key on the reef. To the eastward of this key is very dangerous, being cut up by coral rocks, with channels which should only be attempted through necessity, and in day-light, as nothing is so useful in the navigation of this reef as a good lookout. S. S. W. to S. by W., 5½ miles distant from Dutch Key, (the easternmost of Cow Keys,) are two groups of dry rocks. S., 4½ miles, from the west end of Old Matecumbe, is a coral bank, with only 8 feet on it. S. E. by E., 4½ miles from the eastern end of Old Matecumbe, is another shoal, with only 2 feet, called Alligator Shoal, from the circumstance of the U. S. schooner Alligator being lost on it, and on which the ship Spermo was also lost. Between lat. 24° 51′ and Key Tavernier, which is in lat. 24° 56′, lies the great inlet of the Florida Reef. From this inlet the reef takes a sudden bend, and makes what is called * Carysfort Reef, on which the current sets very strong. From this the reef trends N. N. E. till up with Cape Florida, passing Key Biscayno, on which is a light-house showing a fixed light.

CARYSFORT REEF, inside of which there is a light-ship stationed, as described before, is the most dangerous reef on the whole coast, the south extremity of which is in lat. 24° 59′ N., and lies immediately off Sound Point. Mr. Gaul says, "it is on this reef, which is very extensive, its north part lying opposite Angel Fish Creek, that almost every vessel that is cast away, meets her fate. It is called Carysfort Reef, from his Majesty's ship of that name having been run there by the pilot on the 23d of October, 1770. She

* A floating light is moored on Carysfort Reef, bearing E. by S., 7 miles distant, from the highest land on Key Largo. From the elbow of the reef she bears N. ½ E., from 3 to 4 miles distant, the outer reef (say in 14 fathoms water) bearing E., distant 2½ miles.

was brought off by the skill and diligence of the master, Mr. Hunter, and is the first vessel known to have got clear."

That part of the reef on which the Carysfort ran aground is very uneven, having between some of the patches 3 or 4 fathoms water. Upon one of the patches a ship laden with mahogany ran aground the same night with the Carysfort, but 3 miles without her. It being low water when the merchant ship ran aground, by lighting her she got off at high water. And we would just hint to every one who passes along this coast, that, on seeing a light to the westward, it behoves him to look out for breakers, if he stands in for that quarter.

In latitude 25° 35′ N., according to Mr. Bishop, his Majesty's ship Fowey, after losing all her anchors, beat over the reef in 3 fathoms water, and when within it, drifted five leagues to the northward in 5 or 6 fathoms water: and was afraid of drifting out in the Florida Stream.

The FOWEY ROCKS, lie at the north end of the reef, and are partly dry. The eastern edge of these rocks lies about 6 miles to the eastward of Key Biscayno: they have many bad bars within them. Key Biscayno hath also a bank lying off from its east side.

There are several openings, or in and outlets, over this reef; all of which are safe communications between the Hawke Channel and Florida Stream, having a depth of no less than 18 feet water. By placing a boat on the reef at those entrances, it will always point them out in such a manner, that you may be able to enter, safely, any one of them in moderate weather, when want of fresh water, contrary wind, or any other cause, renders this shelter necessary. Two of these inlets, however, require a little more to be said of them; those are Great Inlet and Spencer's Inlet.

Great Inlet, in 24° 56′ 30″ latitude, has a knoll of dry rocks on the south-east point of the reef, directly on the edge of the channel, whereby it is easily known. Here your eye must be your guide; the land may also help a little, as the two small mangrove keys, Tabano and Rodrigues, show themselves plainly enough in the west.

Spencer's Inlet, in latitude 24° 46′, is opposite to Old Matecumbe, and above 6 miles wide; the eye must be your guide here, as well as in the former, but there are no such visible marks.

The soundings in both are as marked in the chart; and to any person who knows that in a gale, by reason of a reverting current, anchorage is full as safe under a reef as under land, we need not enlarge much about the utility and knowledge of these channels; much less to a man who is either in want of water, or who, upon falling in with these shoals, and thinks himself in danger, has courage enough not to despair. At the outer inlets, the land appears so much alike, that it requires years of experience to know it.

Directions for sailing from the Eastward through the Hawke Channel.

Key Biscayno, on which there is a light-house containing a fixed light, lies within, and forms the west side of the northern entrance of the channel or passage between the Florida Keys, or Martyrs, on the west and north side, and the Florida reefs on the east and south side, called Hawke Channel. The coast for 4 or 5 leagues to the northward of the key, has foul ground, and the sea breaking on it has a frightful appearance, but there is no where less than 3 fathoms; but, by keeping off 5 or 6 miles from shore you will find generally 5 or 6 fathoms, fine sandy bottom; and when you approach the end of the reef, you may haul in towards Key Biscayno, observing to give the reef a good berth without you, on account of several bad sand bars on its inner edge. You will not find less than 3 fathoms any where within, till you come abreast of the south end of the key, where there is a small bank of eleven feet only; but be careful to give the key a good berth, as a large flat stretches from it.

You then steer to the eastward of south, and pass to the eastward of the shallow bank that surrounds Oswald Keys, when the course will be more westerly, by the edge of the bank. The general rule to sail along through the channel, from the Soldier's Keys to the southward, is, to have a careful man at the mast-head, to look out; he will see all the heads and other shoals, in a clear day, at least a mile off. Thus, making the eye your pilot, come no nearer to the Soldier's Keys than 12 feet, and no farther off to the eastward of them than 18 feet.

About a mile E. S. E. from Saunder's Cut lies a small round bank with only 9 feet water on it; from this black spot to Cæsar's Creek, there are several sunken heads, and the bar of that creek reaches a great way out. Right abreast of this spot, and northward of the bar, is a very fine anchorage of 22 feet water, close to the back of the reef, which makes the inlet.

From Saunder's Cut to Saunder's Point there are only 11 feet of water to be depended on; that is, if you keep in that part of the channel which is clearest of rocks, you may find deeper water, by going out farther towards the reef; but the care necessary to be taken in order to avoid the heads is inconceivable.

When you are clear to the southward of Angel Fish Creek, the same rule of keeping

between 18 and 12 feet in the channel is to be observed; but after all that can be said, a careful inspection of the chart, together with a comparison of it, with the course of the land you sail by, and especially a good lookout, will constitute you a better pilot, than any direction that can be given for this navigation. The course from Angel Fish Creek to the north part of Sound Point, is S. by W. ¼ W., and the distance is 5 leagues.

Sound Point is the only spot that may be said to form a true promontory, from the spring in the rock.

From the north end of Sound Point to Rodrigues Key, the course and distance are S. W. ½ S. 7½ miles. There is a good harbor for small craft off the N. W. part of the key, formed by a reef running off its N. E. point; and another good place for shelter to the S. W. of it; but neither has a greater depth than 9 feet at low water. Tavernier's Key, or Tabano, is only a large thicket of mangroves, without any dry soil on it, and affords only some aquatic birds and their eggs.

From abreast of Sound Point to abreast of Tabano, the course is S. W. ½ S., and the distance is 3 leagues. From Tabano, the direction of the coast alters to S. W., and to the east end of New Matecumbe, the distance is 7 miles. New Matecumbe has nothing remarkable, except a well of good fresh water on its east end: but that being known to few, the island is little frequented. Off its S. W. end lies a small drowned mangrove island, called Umbrella Key; a channel 10 feet deep runs in to the south-westward of it, and extends up to the larger island; but there being nothing worthy of notice on this key, it is very seldom visited. In coming this way from Tabano, the channel is in general deeper than before; but the same rule for keeping without 12 and within 18 feet, still holds good; but observe that directly abreast of New Matecumbe, within a mile and a half to the eastward of the land, are several dangerous sunken heads, called the Hen and Chickens, which require particular attention.

The next to the south-westward, is the Island of Old Matecumbe, remarkable for being the most convenient, and best watering place on all this coast. On its east end are five wells in the solid rock, which appear to be natural chasms, yielding excellent water in abundance; and some ponds near them likewise afford some; insomuch, that in a wet season, all the east end of the key is overflown, and water enough may be had to supply a whole fleet. There are likewise some ponds and wells at the west end, but the water is of a much inferior quality. This island was one of the last habitations of the Indians of the Coloosa nation. About a mile from its N. E. end, on the extremity of a reef, lies the small bushy gravelly key, called Indian Key, which is the leading mark for finding the watering place on Old Matecumbe. Run to about a cable's length off the east side of the key, and the channel will be easily distinguished by your eye, as before said. Observe that the tides being very rapid, require particular attention, in going in or out; and that the channel is very narrow, having only just room enough for a small vessel to turn to windward.

From the south-west end of Old Matecumbe to the west end of Cayo Bivoras, or Viper Key, the course and distance are S. W. by W. ¼ W., 7 miles; the depth of water is from 16 to 18 feet, sandy bottom; but you must be careful to give the Bivoras a berth of at least a mile and a half. From abreast of the west end of Bivoras S. W. by W. ½ W. 11 or 12 miles, brings you to a contraction of Hawke Channel, between the Outer Reef and Cayos de Vacas; your depth is generally 18 feet, the bottom is sandy, and a broad bank runs off from the Vacas Islands. At this contraction of the channel the course must be altered W. S. W. ¼ W., going through the like depth of water for 5 miles. In running this last distance, care must be taken to avoid the shoals lying off the S. W. part of Cayos de Vacas, heretofore described.

From the west end of Cayos de Vacas to Cabbage Tree Island, or Bahia Honda, the course and distance are W. S. W. ¼ W., 10 miles. In this run you will find 3 fathoms water all along within a mile of the keys, the deepest water being nearest to the reef. Hence to the west end of Cayo Hueso, or Key West, the course and distance are W. S. W., 31 miles, the depth of water from 17 to 23 feet. Key West is about 5½ miles in length, having a shallow bank before it, which extends close round its west end, as has already been said, and near which end is a well of ordinary water. All these keys have plenty of venison, and in some of them honey is found. From abreast of Key West, a W. by S. course, 5 leagues, and W. S. W. ½ W. 8½ leagues, will carry you to the west end of the channel, abreast of the west end of the Quicksands, which extend westward from Cayo Marques. This bank of quicksand may be always seen in the day time, it being very white, and therefore may be easily avoided.

THE TIDES.—The tide ebbs and flows here regularly, and the time of high water, on full and change of the moon, at Key West Harbor, is 20 minutes after 8 o'clock. Spring tides rise 4 feet 5 inches, and it is nearly the same every where, from the Dry Tortugas to the Cayos de Vacas. The tides from Cayos de Vacas, north-eastward, rise not quite so high, and the time of high water is earlier. Within the northern entrance of Hawke Channel, opposite Soldier's Keys, it is high water at half an hour after 8 o'clock, and spring tides rise only 2 feet 6 inches. To the northward of Key Biscayno,

the stream on soundings is much influenced by the wind when it blows fresh; but with moderate breezes the ebb sets northward, and the flood southward; a due attention to this will contribute to shorten a passage over soundings to the reef.

Having observed, in the course of long experience, that several masters of vessels, who had the misfortune to be cast away on the Martyrs, and the coast of Florida, ignorant of the existence of any settlement at Cape Florida, have attempted to proceed to the northward in their boats, deprived of every assistance, I feel it incumbent upon me to inform such as may hereafter experience a like misfortune, that if they pass to the north side of Key Biscayno, on which a light-house is erected, as before mentioned, they will find the entrance of Boca Ratones, through which they can safely go with their boats, and they will see the houses in front, on the main land.

In case of shipwreck to the northward of Boca Ratones, at the distance of 2 miles therefrom, they will perceive mangroves thinly scattered, from whence the houses may be seen, and in that situation, on making a signal with fire, or otherwise, they will obtain assistance.

If it should happen to the southward of New River, they may proceed southwardly along the beach, where they will meet, every 4 miles, with posts fixed in the ground, on which is an inscription, in English, French, and Spanish, informing where wells of fresh water have been purposely dug for relief.

Channel of Florida, between the Reef and Keys.

The western part of this channel begins with a breadth of 3½ or 4 miles, and you will find in it from 6½ to 10 fathoms water, sand and mud, or ooze, as far as Boca Grande, from which to Key West light, it is generally about 3 miles wide, and its depth 6 and 10 fathoms, fine sand and mud. In this last piece of the channel there are two shoals; the one nearly north and south with the easternmost part of Key Boca Grande, and the other S. S. W. from the westernmost part of Key West, and both in the middle of the channel.

From these shoals the channel continues with a breadth of 4 miles as far as Samboes Keys, from which to the eastward its breadth diminishes, and the reef increases in the same proportion, so that the channel is only 1½ mile wide at the distance of 5 miles west of * Looe Key beacon, and this is the narrowest part of the channel, but drawing up with Looe Key beacon, the channel begins to widen, so that north and south of Bahia Honda it is 3 miles wide. The depth in these narrows is 3 fathoms, and continuing to the eastward, you augment your depth to 6 fathoms.

From Looe Key the channel continues to its end with a breadth of 2 or 3 miles, but its depth varies remarkably, so that as far as Cow Keys, you have 4 to 6 fathoms, and from thence to the eastward of it goes on diminishing, and when abreast of Old Matecumbe you have but 3 fathoms, and abreast of Key Tobano only 2 and 2½; besides which, from Looe Key, the channel has many coral shoals, which although by day they offer no risk, (as the dark color shows their place,) yet by night they are very dangerous; and it is absolutely necessary to anchor, and lie by for the night, throughout all parts of this channel.

In Bahia Honda you get excellent water by digging wells, and on the south side of Cow Keys, about 8 miles from its western end, you again have a fine spring.

These are the only places among the keys where you can find water from natural springs; but there are many natural tanks, where rain water is preserved till evaporated.

On the north side of Cow Keys, and about 6 miles east of the west end, you will find a natural pond, that never wants water, which is in a valley, distant from the beach about 100 yards, and the landing is something to the westward of three small mangrove islands, called Stirrup's Keys. You may also, at times, find water on the western extreme of Key Vacas (Cow Keys;) also in some of the keys in its vicinity, and on Dutch Key, and generally in all those places where the earth is rocky, you will find water, especially after rains.

A LIGHT-HOUSE is erected on Whitehead's Point, which is the S. W. point of the Island of Key West. The light is elevated 83 feet 6 inches above the level of the sea, and shows a fixed light.

KEY WEST.—A white spar buoy with a flag, is stationed on the reef, about nine miles from the light-house, on Whitehead's Point, from which it bears S. S. E. It is anchored in 27 feet of water, at low tide, and vessels crossing the reef by this channel, will find the best water close to the buoy on the west side.

The proper course to pursue, to bring into the harbor the greatest draught of water from this buoy, will be to run for the light-house, passing at the distance of about a quarter of a mile, a tub buoy, with a staff and imitation ball painted black—making the situation of three coral heads, on one of which there are only fourteen feet of water at low tide. You leave this buoy on the larboard hand, and when two miles distant from the light-house, steer N. W. by W. until you pass a second tub buoy, painted black, sta-

* On Looe Key is a beacon, 30 feet high, on which is a large ball, painted red.

tioned off the light-house point in 6 fathoms water; you then steer N. by E. ½ E. until you open Freemings Key, a small mangrove island in the northern part of the harbor, for which you then run.

N. W. PASSAGE.—Vessels bound through the North-west Passage, will run, from the last named buoy, N. W., and they will then enter the passage, which is staked out for about 6 miles. The stakes on the north and south sides are painted white, and have keys on their summits also painted white; those on the large middle ground are painted white with black crosses, and those on the small middle ground are all black.

The stakes are all in about two feet of water at low tide, and a vessel drawing 9 feet of water can approach generally within 40 yards of any one of them; but 3½ fathoms, at least, can be carried between either of the middle grounds and the north or south sides of the passage, or about 9 feet between the two middle grounds.

After passing the stakes, vessels will shape their course for a tub buoy, painted black, having an imitation ball, which is anchored in 3½ fathoms water about half way from the last stake to the bar. Passing this buoy on either side, you will at present run N. W. ½ W., about two miles, which will bring you to the bar, and on hauling up north you will cross it in ten or eleven feet water at low tide.

The light vessel for the north-west bar of this harbor, lies about 8 miles from Key West, at the junction of the north-west channels, so as to serve as a guide to vessels entering either.

Vessels from the westward, coming in by the North Channel, will bring the light vessel to bear due south, and run directly for her; and on reaching her station, will then run for the light-house on Key West, unless the tide should be extraordinarily low. There are not ten feet in this channel at low water, and twelve feet at high water.

Vessels coming in by the North West Channel, will bring the light vessel to bear south-east half east, run for her, and then steer for the light-house as before. This channel is considered the best, having from one to two feet more water than the other.

Masters of vessels going out from Key West, will merely reverse the above directions.

The light vessel shows one light at an elevation of about 60 feet, which may be seen, in clear weather, nine or ten miles.

CAPE ROMANO is a long low point with mangrove trees on it Off this point lies a sand bank, which extends off 9 miles S. W. from the point, and has about 3 feet water on it. The shoal is regular as you approach it. Thirty miles to the N. W. lies the Island of Sanybel. If you are running for this island, keep in 4½ and 5 fathoms water. At the S. W. end of this island there is a good harbor with 12 feet water in it, which, if you wish to enter, give Sanibel Point a berth of 5 miles, as there is a long bank making off from it; run in for the land in 2½ fathoms, and then steer up N. W. until you shut in the point of the islands, where you can anchor in 12 feet water.

There is a large Spanish establishment for fishing, and you can obtain provisions, wood, and water.

General Description of the Coast from Cape St. Blas to Point Tantha.

CAPE ST. BLAS.—Cape St. Blas is a low point, which runs to the southward two miles. From that part where trees end on this point, a shoal of sand runs S. S. E., 4 miles, bearing from S. S. E. to S. S. W. from the point. Various shoals and small spots of sand, having less than 3 fathoms water on them, also lie off the same point, the southernmost of which is 17 miles distant; between these shoals there are 7, 8, and 9 fathoms water.

S. 77° E., 16 miles from Cape St. Blas, lies the south point of St. George's Island, called Cape St. George, between which is the main entrance to St. George's Sound and Apalachicola Bay; the bay is distant about 12 miles from the entrance into the sound between St. Vincent's and St. George's Islands in a straight line, but owing to the obstructions in this part of the sound, vessels are obliged to bend their course to the east to reach Apalachicola River, which increases the distance to 18 miles.

Vessels drawing 10 feet water can anchor in the bay, but only 7½ feet can be carried to the town.

From Cape St. George's (which is shoal to the south) for 5 miles the coast doubles round to E. N. E., and at the distance of 24 miles from the cape is the east end of this island, and the middle entrance into the sound: this entrance is formed by the east end of St. George's and the west end of Dog Islands; the distance between the two is 3 miles. The channel is contracted between by shoals, which make out from the two islands: the depth of water on the bar is about 14 feet, and the width one-third of a mile. The channel is near Dog Island.

Dog Island is 6 miles long, and trends nearly the same as St. George's; at the east end is the eastern entrance into St. George's Sound: this entrance offers a depth of 14 feet on the bar, which is above one-third of a mile wide, and is within that distance of the island.

St. George's Sound, from the eastern to the middle pass, affords from 2½ to 3 fathoms

water; but to the westward, towards the main entrance, the sound is much obstructed by oyster banks, through which vessels drawing more than 6 feet water cannot shape their course.

The mean rise of tide, 2¼ feet.

N. 50° E. from the east end of Dog Island, 7 miles distant, is the S. W. Cape; this distance is shoal, if we except the channel above mentioned, and to the south of the cape the shoal extends to the distance of 3 miles.

From the S. W. Cape the coast bends to the northward, and after to the eastward, and forms a large bay, into which the River Apalache is emptied.

This river is shoal, and obstructed at its entrance, and for a long distance off, by many oyster banks, which are dry at low water; the tide rises 2½ feet.

About 8 miles up the river from the bar, is the Fort of St. Mark's, situated on a point which forms the confluence of the river, of which the east branch is called St. Mark's, and the other Warcaller. The shoal water which is found in this river, is also found all over this large bay, and 8 feet is the best water in the channels.

St. Mark's River affords 8 feet water at its mouth at high water, and 8 miles lower down, good anchorage for vessels drawing 10 feet. Here are two bars, one 3 miles below Fort St. Mark's, called the Devil's Elbow, with a depth over it of 8 feet at high water; the other, called the Outer Bar, 8 miles from the fort. From this bar to the Devil's Elbow the average depth is 10 feet; the channel takes a sudden turn at the Devil's Elbow, and the width is reduced to about 40 feet for a quarter of a mile. From the Devil's Elbow to Fort St. Mark's, 8 feet can be carried through at high water. The place called the Spanish Hole, 3 miles within the outer bar, is the best place to anchor; the depth is 12 feet at high water. The outer bar is in some way connected with the extensive shallow banks, which to the east and west obstruct this part of the coast, and serve to protect the anchorage within the outer bar, which is the only shelter for vessels drawing 10 feet water from the S. W. cape to Espiritu Santo.

From Apalache Bay the coast bends off to the southward and eastward to the river Suwannee in Vassasousa Bay, which is 23 leagues distant from the river of Apalache. Oyster banks obstruct this bay, and the Suwannee cannot be entered at high tide by vessels drawing more than 5 feet. From the river Suwannee to the southward, you lose sight of the land, as only canoes can get nigh enough to discover the keys called Sabinas. Fifty miles south of the Sabinas lies the key Anclote, or Anchor Island, and before you come to it you may discover the coast. The whole of the coast from S. W. Cape to this key, is so shoal, that at ten leagues from the land you have but 5 and 6 fathoms, and two leagues you will have from 6 to 7 feet. Key Anclote is distant across from the main land four miles, and in length about eight miles north and south; it is divided into three parts, and its south part has good anchorage in 3 fathoms water.

CEDAR KEYS are in lat. 29° 9′ N., long. 83° 9′ 30″. Pilots can be obtained on making a signal.

From Key Anclote the coast runs S. E. by E. 30 miles to the entrance of Tampa Bay, or Bahia del Espiritu Santo. The coast between is clear and deeper than the anterior. At 3 leagues from the land you will have 6 fathoms water, and no impediment to your keeping in with it by the lead. Off this coast there are various keys, which lie, at most, only four miles from the main.

From Tampa the coast continues S. E. by S. 22 leagues, to the Bay of St. Carlos; all this piece of coast is bordered with keys which lie about four miles off from the main land; the whole is clear with the exception of a sand bar, which runs off from what is called Boca Quarazote, which is an opening formed by two of the above mentioned keys, and is distant from Tampa 21 miles. On this bar there are 2 fathoms water, and all along the coast you will have 4 fathoms at 5 or 6 miles from it, so that there is no danger in keeping in with it by the lead.

Carlos Bay is a large entrance made in the coast, in which are emptied various rivers, whose mouths are covered by many keys and shoals, which leave between them channels more or less wide; the northernmost is called Friar Gaspar, and has 6 feet water; the next, called Boca Grande, is the deepest, having 14 feet water. This bay is only good for vessels of 8 feet draught, by the little shelter which it affords in gales in winter; and although the holding ground is good, you are obliged to look for the bends of the bay to shelter you from the wind which blows. The tide rises two feet, and when the wind is off shore, it runs with great velocity.

The key, whose north extreme forms what is called Boca Cautivo, is the same whose southern extreme forms Boca Ciega, which is the opening which said key forms to the northward, and Sanybel to the southward. This opening extends to Shoal Lagoon, which communicates by various shoal channels with Bay St. Carlos.

Key Sanybel has good anchorage on its south part in 2 fathoms, sheltered from all winds. This anchorage of Sanybel is known by a palm tree, two leagues to the southward of it, and is the only one you see on the whole coast. To anchor in Sanybel,

it is necessary to run with care, and the lead in hand, that you may avoid the shoal bottoms which run off four miles from Sanybel, and the keys S. E. of it.

From Sanybel the coast runs S. E. by E. eleven leagues to Point Largo, or Key Roman. This piece of coast is clean, having 3 fathoms at two miles from the land. Point Largo sends out S. and S. W. of it a shoal, which runs from it seven miles, and the coast bending to the eastward forms a bay of 12 feet water, in which vessels of light draught may enter and find shelter from winds any way on the northern board.

The coast from hence runs S. S. E. twenty-five leagues to Cape Sable, which is the southernmost promontory of the peninsula of East Florida.

The whole of the coast has regular and clean soundings, whence the lead is the best guide.

BOCA GRANDE, has a good harbor, with 18 feet water on the bar. If you wish to run into this harbor, bring the N. W. end to bear N. N. E., steer in for the point, and you will see a small sand island; you will have 4 and 5 fathoms water, and can see the bank on both sides; about one mile from the point of this island, stands a high bunch of trees; a little to the S. E. of them stands five scattering cabbage trees, and the point of the other island which forms the harbor is a low sand point. Here there is another Spanish fishing establishment, and the bay affords plenty of fish and oysters. The bar lies about 5 miles from the entrance, and it is advisable to keep in 5 fathoms till you get your bearings.

TAMPA BAY.—The next harbor to the N. W. is Tampa Bay, or Spiritu Santo. A spar buoy, 80 feet high, with a barrel on it, painted white and black, is planted on Egmont Island; it may be seen before the land.

To enter the bay, bring the beacon to bear E. $\frac{1}{2}$ S., by compass, then run for it, until you have $3\frac{1}{2}$ fathoms water, which will take you over the bar; then steer E. $\frac{1}{2}$ N., until the beacon bears E. by S., and then follow the northern bank, which can always be seen within a cable's length. Run for the beacon to near a cable's length, and you will have 10 fathoms water, the beacon bearing south; then run E. by S., to $4\frac{1}{2}$ or 5 fathoms; then E. N. E., 6 miles, and N. E., to 3 fathoms, off Mangrove Point; then N., to 4 fathoms, and N. E., to the anchorage at Gadsen's Point.

This bay has sufficient depth of water for frigates; for there are within it 5 and 6 fathoms water, and although there is a bar at its entrance, the least depth on it is $3\frac{1}{4}$ fathoms. The entrance is obstructed by several sand banks, upon which rise some inlets; between these banks there are three channels, named the West, the South West, and the South East. The two first have plenty of water on their bars; for the first has $3\frac{1}{4}$ fathoms, and the second has $2\frac{3}{4}$ fathoms. The channels are clear, and to take them there is no necessity for instructions, as the shoals are distinctly seen at high water, and at low water they are dry.

A few miles to the N. W. of Tampa Bay is Prince Edward's Islands, the western one of which is a small round high island; the course of these islands from this to St. Mark's, forms a deep shallow bay; the shoal ground runs 7 miles from the land, and the bank is nearly up and down, with three fathoms along the edge of it.

A LIGHT-HOUSE, containing a fixed light, is on the eastern side of the entrance to St. Mark's.

ST. MARK'S.—If you are bound to St. Mark's and fall in to the S. E. of it, work along this bank, which will bring you up to the mouth of the river; and if you wish to run into port St. Mark's Harbor, the entrance affords 12 feet water, and you will see, on the N. E. bank, which is nearly dry at low water, a large stake sticking on it, and the one on the other side has three stakes on it. You will see a small house, on an island four miles from the mouth of the river, which bring to bear N. by W., leaving the light-house on your starboard hand, and that course will carry you up between the two stakes; when you are between the banks, half way up, you have good anchorage: From this up to Fort St. Mark's you can have but 9 feet of water. A pilot can be obtained here at any time. S. S. W. from St. Mark's light-house, 15 miles distant, lies the south point of James' Island, called the S. W. Cape; a bay makes in between St. Mark's entrance and this cape, into which the River Okonofrisky discharges itself; this river is shoal at the entrance, and the shore from the cape to the light should not be approached nearer than two miles.

A shoal, having three feet water on it, lies E. by N. from the cape; and the easternmost end bears from the light-house south.

The coast trends from S. W. Cape, S. W. $\frac{1}{2}$ W., 37 miles, to Cape St. George, which is the southernmost point of George's Island; this island is 24 miles long, and forms with Dog Island, the south side of George's Sound. The east end of Dog Island is S. W. $\frac{1}{2}$ W., 7 miles from the S. W. Cape, between which is the eastern entrance to St. George's Sound. Dog Island is about 6 miles in length.

DOG ISLAND LIGHT is a revolving light on the west end of Dog Island. It revolves in three minutes, and bears from the bar N. $\frac{1}{2}$ E., distant $2\frac{1}{2}$ miles. To distinguish it in the day-time from the light-houses of St. Marks and St. Georges, it has a black horizontal stripe near the top.

MIDDLE ENTRANCE INTO ST. GEORGE'S SOUND.—For vessels drawing 12 feet of water this entrance is to be taken, as you cannot carry into the main entrance, so called; which is between the N. W. end of St. George's Island and St. Vincent's Island; over 11 feet at high water. The middle entrance or passage into St. George's Sound is between the West end of Dog Island and the east end of St. George's Island, and is about 3 miles wide; it is rather difficult to find for strangers, as the west end of Dog Island and the east end of St. George's Island are both low sand beaches, and there is a sand beach on the main directly in front of the passage, so that it looks, at 3 or 4 miles distant, like one continued beach.

After making the passage, steer for it, keeping most towards Dog Island, as the channel is altogether on Dog Island side. You will soon see a large green buoy, which lies in the best water on the buoy; pass close to this buoy on either side, and stand in N. N. W. along Dog Island Reef, which can be plainly seen, until the eastern point of George's Island bears S. W., or S. W. ½ W., then haul up the sound for the shipping, say about W. S. W.; continue on this course until the eastern point of St. George's Island bears about E., 2 miles distant, and a black buoy on shore, well under St. George's Island, bears about S. E. ½ S., half a mile distant, when you may anchor in from 2 to 2½ fathoms.

There is a barrel buoy a short distance outside the green buoy, a black buoy on Dog Island Reef, and a white buoy on the eastern extreme of St. George's Island Reef; these buoys are not to be relied on, as they shift their position with every strong breeze; they are placed there by the pilots; the channel being perfectly plain and the reefs visible, they would in any case be of little use.

On the N. W. point of George's Island a light-house with a fixed light is placed, to indicate the entrance between George's Island and St. Vincent's Island into St. George's Sound.

APALACHICOLA BAY.—When the south point of St. George's Island, (which lies to the southward of Apalachicola Bay,) bears north, two leagues distant, you will be in 2½ fathoms. From these bearings and depth of water, steer N. N. W., or N. by W., until you make the large black buoy,* which can be seen at the distance of 4 miles; by keeping the buoy close on board, you have the best water; the course from the buoy is due north, until you bring the three tall trees on St. Vincent's Island to bear N. E., then run for them. The entrance then being fairly open, steer for the point of St. George's Island, or between the point of that island and St. Vincent, you will have three fathoms when over the bar, deepening gradually; and between the Islands of St. George's and St. Vincent, you have 8 fathoms when fairly in. When past the point of St. George's haul to the eastward, and keep from one half to three-quarters of a mile distant from St. George's Island. The water will shoal in this course to 2 fathoms, soft bottom, when you had better come to anchor and wait for a pilot, which you will obtain by hoisting the usual signal.

When off the entrance, in 6 fathoms, no inlet can be discovered between the two islands, but the place may be known by the bearings of the land. It is a low sand beach, having a hummock of bushes about one mile from the west point of St. George's Island, to the westward of which are four umbrella trees, the two easternmost standing 6 or 8 feet apart, at top connected, and at a distance having the appearance of one tree. To the west of these trees is a hummock of palmetto trees, which stand nearly on the extreme west end of St. George's, which are considerably larger than the hummock of bushes before mentioned; and these, when distant so far that you cannot see the beach, that bearing N. E., appears as separated from the other land, and to form an island by itself, but when bearing N. W., appears connected with the island of St. Vincent, which is thickly wooded on the eastern end. This hummock is, however, on St. George's.

The south point of the Island of St. George's is thickly wooded, and can be discerned when in 10 fathoms, bearing N. E.

Should you have a foul wind, and be obliged to turn to the windward, keep the Island of St. George's on board; when fairly to the westward of the south point, the water is good near the beach, and soundings regular.

Directly off the south point of St. George's, there is a dangerous shoal of 2 or 3 leagues extent.

The Shoal of Cape St. George makes off at least 6 miles from the south part of the island, and has not more than 5 or 6 feet of water, perhaps less. The soundings near the shoal, on the W. edge, are irregular, from 3 to 4 and 2 fathoms.

Description of the Coast from Cape St. Blas, Westward.

From Cape St. Blas a narrow peninsula or tongue of land extends N. by W. 17 miles, forming the Bay of St. Joseph. This bay is nearly land-locked, and has a width at its mouth of about 3 miles, and is about 14 miles in length. The bar lies west of the north

* An island, called Flag Island, formerly existed at the entrance of this port, but it was washed away in 1835; the buoy alluded to was placed on a rock.

point of the peninsula about one mile. Within the bar the bay affords from 25 to 33 feet of water for about 8 miles up the bay, and it is sheltered from all winds. The tide rises about one foot. This is the next best harbor to Pensacola on this coast, the depth on the bar at low tide being 17 feet. The tongue of land that forms this bay is so narrow, that in some places it is only two cables' length in width. There are various breaches in it in time of rains, by which the water of the bay unites with the ocean.

ST. JOSEPH'S LIGHT is on the northerly end of the peninsula or tongue of land, and is a fixed light, bearing from the north point S. W., distant about three-quarters of a mile, and from the city of St. Joseph N. W., 9 miles distant. On approaching the light from St. Blas, along the land, it is discerned by the trees, until mostly up with it, if clear in with the beach.

To enter this bay, you must coast along the tongue of land in 4 or 5 fathoms, until you pass a tongue of sand, a little before you come to the mouth, from whence you steer N. E. and E. N. E. till within, always coasting the tongue, which is the deepest water.

N. W. by N., 10 miles from St. Joseph's Bar, is the entrance to the Bay of St. Andrews; in this distance the coast should not be approached nearer than 5 miles, on account of a shoal that extends the whole distance, called the Middle Ground, which may be easily discovered by the whiteness of the water. The S. E. extreme of this shoal, and the above tongue, form the entrance to the Bay of St. Joseph.

BAY OF ST. ANDREWS is covered by Crooked and St. Andrews Islands, which comprehend between them and the Main St. Andrews Sound, which leads into the bay.

There are three entrances into this bay; the eastern is through the opening between Crooked and St. Andrews Islands, the depth 3 fathoms on the bar, and the channel, which is one-sixth of a mile wide close by the latter island; the distance between the islands is above two-thirds of a mile. The middle or main entrance is near the western end of St. Andrews Island; the depth 21 feet, and the channel 200 yards wide. The western entrance is about two miles N. W. of the latter; the depth on the bar 10 feet. This bay is very large, but as yet there can be no motive for ships to call here; but should you do it for shelter in bad weather, the bay is said to be shoal, but from the main to the eastern entrance you have 3 fathoms in the sound, and good shelter under St. Andrews Island.

N. W. by W. from St. Andrews Bay, distant 50 miles, is the entrance to St. Rosa's Sound: in the whole of this distance the shore is bold, and you will have 4 fathoms close to the land. On this coast the trees are very thick, and close to the shore, where there are also some red bluffs, and white sand hummocks.

ST. ROSA'S BAY.—The east point of this bay is known by some bright reddish colored bluffs, which are upon it. The channel, or mouth of the bay, is very narrow, and a bar of only 5 or 6 feet impedes its entrance. To enter, steer N. till you pass the east extreme of the island, whence steer N. W. and anchor as soon as you have shelter. This bay is of extraordinary length, extending 24 miles to the eastward, with a breadth of 4 to 6 miles. The best water in it is 3 fathoms, which is only found when you are E. and W. with the red cliffs at the entrance, about two miles from the bar. The other part of the bay is full of shoals and palisadoes, navigable only for boats.

From St. Rosa's Bar to the western end of St. Rosa's Island, the distance is 44 miles. This long and narrow island lies about W. by S. and E. by N., parallel to the main, and covers a sound of the same name; its greatest breadth is not more than half a mile: on it there are many sand bluffs and some scattering trees. The sound affords a navigation for vessels of less draught of water than 4 feet to Pensacola.

PENSACOLA LIGHT-HOUSE is on an eminence, about 40 feet high, and directly N. by W. from the bar; the lantern is about 40 feet from its foundation, making an aggregate height of 80 feet above the level of the sea, and is about half a mile Northwesterly from the west point of St. Rosa Island. The light is revolving, each revolution one minute ten seconds.

PENSACOLA.—The Bay of Pensacola affords a good harbor, having, at low water, on the bar, 21 feet. The eastern point of its entrance is called Point Siguenza, and is the western point of the Island of St. Rosa, on which fortifications are erected, making it very conspicuous from the sea. St. Rosa Island extends E. by N. and W. by S., 14 leagues, and completely fronts the whole Bay of Pensacola; it is so low that the seas, in gales, wash its tops, and is no where more than one-fourth or one-third of a mile wide. There are some red bluffs on the main coast, which are higher than the rest of it, and one of which, and the largest of all, is on the eastern side of Pensacola Bay; and in or near the front of the entrance, are three red bluffs adjoining each other, and called the Barancas.

The channel entering Pensacola Bay is from the south-east, and turns round a middle ground which projects nearly one mile to the S. W. of Point Siguenza; it then bends to the eastward towards the bay. A bar, projecting about two miles to the south, and extending from the western end of St. Rosa Island to the main opposite, has at low tide 21 feet on it. The width of the bar taken in the direction of the channel is about one mile. The entrance between St. Rosa's and Foster's Islands, is about a mile and a

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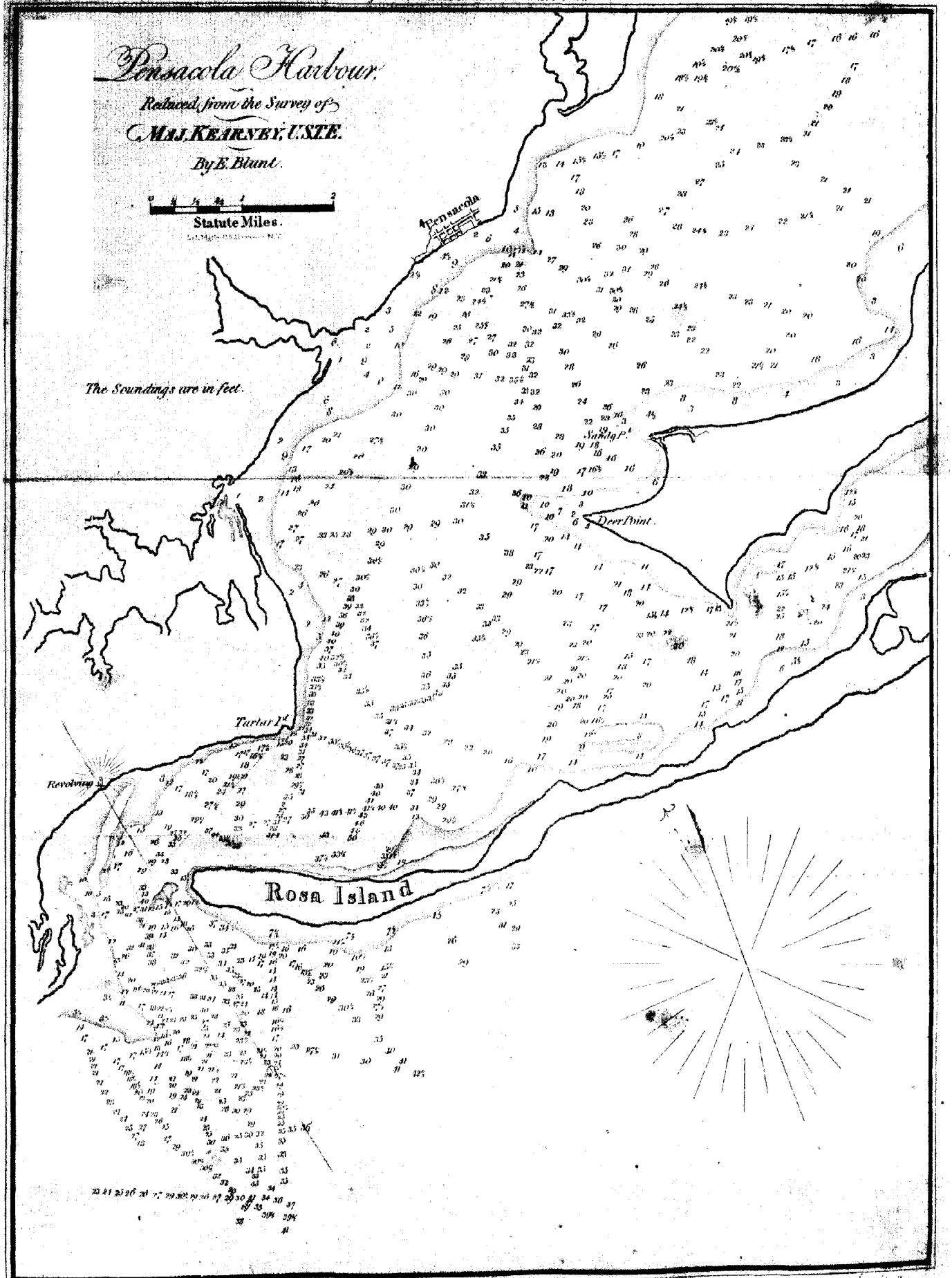

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quarter wide. After passing the bar the entrance to the bay is between the Barancas and Point Siguenza. This port would be difficult to recognize, were it not for the light-house and bluffs, which, consisting of 3 adjoining each other, cannot be easily mistaken.

The interior of the bay affords great depth of water and good bottom for anchoring. However, a considerable extent of its shores are shallow, but at some points a good depth is found within a short distance of the land, viz. at the Careening Ground, 18 feet are to be found at about 50 yards from the shore; at Tartar's Point, where the Navy Yard is, 30 feet are found within a few yards of the point and 12 feet west of it; at the English Careening Ground, 18 feet can be carried close to the shore.

The bar is not the only difficulty entering Pensacola, since you meet, when within it, the Middle Ground, as previously stated, and although it is decidedly the best harbor in the Gulf of Mexico, you must observe the directions, and frequently have recourse to your plan of the port, which will give you a correct idea of its configuration.

Vessels coming from the eastward, should keep in 7 fathoms water until the light-house bears by compass N. by W., when they can stand in for the bar, until in 3½ fathoms, which is the shoalest water on the bar at low water, with the light bearing N. by W.

Vessels of large draft of water should not attempt to enter in the night, as there is a Middle Ground on the east side of the main channel, one mile inside the bar, on which there are not more than 7 feet water, and the course around it is very circuitous.

Vessels making the land, should keep off four or five miles, until they make the light-house, which cannot be seen until nearly opposite, as the trees on St. Rosa Island to the east, and on the main land to the west, obscure it from the river.

To come in over the bar, on which generally there are 4 fathoms, bring the light to bear N. by W. and run directly for it, until over; the bar is about 600 yards across, on which is a buoy; soon as over, the water deepens to 5 and 6 fathoms, when run N. W. until the light-house bears N., in order to avoid the Middle Ground, when run for it until within the point of St. Rosa Island; then haul up east until the west end of St. Rosa Island bears S. W., when you may anchor in 4 or 5 fathoms water, safe from all winds.

Small vessels drawing not more than 14 feet, can bring the light to bear N. ¾ W., and steer for it in the night until within half a mile, where they can anchor with the wind off shore; but if they have a fair wind, they can steer E. by N. until sheltered by St. Rosa Island, where they can anchor in a good harbor until day-light, as it is everywhere excellent.

Vessels coming in or going out on ebb tide, should (preserving the necessary depth of water) keep near the eastern edge of the channel, as the tide runs to the south-west across the Caucus Shoal, and the flood sets directly over the Middle Ground.

Vessels drawing not more than 10 feet water, can pass through a small channel between the Middle Ground and the point of St. Rosa Island.

From Pensacola Bay the coast trends W. by S. to Perdido Bay, distant 11 miles; this bar is subject to change, and affords but about 4 feet water, and 28 miles to the westward is the bar and entrance to Mobile Bay.

MOBILE BAY.—A light-house is erected on Mobile Point; the lantern is 55 feet above the ocean level, and shows a revolving light of one minute in duration. S. 5° E. from the light, 5 miles distant, you have 3 fathoms on the bar. The east end of Dauphin Island will then bear N. N. W. ¾ W., and Sand Island (just above water) will be on the middle of Dauphin Island. On Sand Island there is a light-house containing a fixed light.

The entrance to Mobile Bay is between Mobile Point and the eastern point of Dauphin Island; the distance between them is 3¼ miles. To the south of Dauphin, about one mile, is Big Pelican Island, which is barren and of small extent, and E. S. E. from the latter island, distant 3½ miles, is Little Pelican or Sand Island, which is of but few yards in extent, and nearly even with the water's edge. A bank, projecting to the south of Dauphin Island and Mobile Point, on which are the above islands, obstructs the entrance to the bay; but, however, affords through it various channels, the main one having 15 feet on the bar at the lowest tide. The interior of this bay has water enough for any vessel that can pass over the bar; but on account of a shoal formed opposite the mouth of Dog River, 11 miles south of the town, vessels drawing more than 8 or 9 feet cannot, at low tide, ascend the bay further up.

By following close to the south shore of Dauphin Island, and having Big Pelican Island on the starboard hand, coming from the westward, vessels drawing 7 feet water can enter the bay at low water; but to do this, you must, when the east point of Dauphin Island is north of you, steer to the southward to avoid a narrow sand spit which projects off from the point 1¼ mile S. S. E.; haul close round this spit, and steer up the bay.

There is good anchorage between Big Pelican and Dauphin Islands, and close to the latter, for vessels drawing 12 feet; this anchorage can be entered either from the westward, by steering close to Dauphin Island, or from the main channel, leaving it when Big Pelican Island bears W. by N., (about 2 miles S. W. from Mobile Point.) During the prevalence of northerly winds, when vessels from sea are prevented from entering the bay, this anchorage affords good shelter.

Those off Mobile should recollect the necessity of getting an offing as soon as there

are appearances of a gale on shore, either to weather the Balize, or which is better, to take in time the Road of Naso, as destruction is inevitable if you come to anchor outside Mobile Bar during the gale.

Strangers approaching Mobile Point in the night, should keep in 10 fathoms water till the light bears north, to avoid the dangerous sands lying to the eastward, and the shoals off Pelican and Sand Islands, on which is a beacon, to the westward of the bar.

In running in for the land, should you make it to the westward of the bar, it will appear broken, as it consists of small islands, which occasion several openings. More to the westward the land is very level. Dauphin Island, on the western point of the bay, appears high and bluff; Mobile Point, low and sandy, with a single tree on the extremity.

Vessels approaching the entrance to Mobile Bay in the day, should not run for the bar until the beacon on Sand Island ranges between the east and west ends of the woods on Dauphin Island.

Vessels not drawing over 10 or 11 feet, and with easterly winds, may haul in for the bar as soon as the beacon comes on within the west end of the woods, and keep it on thus until they get 7 or 8 fathoms water, when they will gradually haul more northerly; at this time all the dangers will be visible. Heavy ships must bring the beacon on with the centre of the woods, and cross the bar with it thus, in about 18 feet water, steering up N. N. W. until abreast or past the beacon and island on the larboard, from which an extensive shoal makes in every direction. Within the bar are two buoys, the first to be left on the starboard, and the second on your larboard hand. The channel up thence is deep and plain. Mobile Point light-house bearing between N. and N. N. E. Tide rises 2½ feet.

From Mobile Bay to the Bay of St. Louis, the distance is 65 miles west: on this extent of coast there is a chain of islands parallel to the main, forming a sound, which affords a partial inland navigation, and is about 7 miles wide. This coast is marshy, but at two or three miles from the shore it is covered with pines and oaks. The islands are sandy.

The sound enters Mobile Bay between the main and Dauphin Island. At this place the bottom, formed of oyster beds, presents three shallow passes, viz: Pass Aux Huitres, with a depth of three feet at high water; Pass Guillori, 2 feet at common high tides, and the Pass au Heron, with nearly 5 feet.

Dauphin Island is 7 miles in length, and the next succeeding is Massacre Island. The entrance between these two is 3 miles wide, and the depth of water 5 feet. Massacre Island is narrow, but it is very easily known, since it has a wood in the middle of it: it is about 9 miles in length.

The passage between Massacre and Horn Island is two miles wide, and vessels drawing 9 feet water can enter it. The length of Horn Island is about 15 miles. On its western point there is a light-house, with a fixed light, to point out the entrance to Dauphin Island Sound, between the western end of Dauphin Island and Ship Island. There are some groves on it, but at the eastern part it is entirely barren.

The next of the chain is Dog Island, a small island lying midway between Horn and Ship Islands. To the east of Dog Island there is a passage close to Horn Island, of 18 feet; but to the west there is no passage, as the shoal which extends off from Ship Island extends beyond Dog Island, having a channel of only one-third of a mile wide. The distance from Horn to Ship Island is about 5 miles. Ship Island is 7 miles long, and wider than the rest of the chain: in its middle it is covered with herbs and some pines, but the rest is entirely bare. There is a well of very good water on it, on the north side, about the middle.

West from Ship Island is Cat Island, between which the distance is 5 miles. There is a bank which puts off from Cat Island, towards the west end of Ship Island, having a channel of only a mile wide, which turns round the west end of Ship Island, and in which there are 18 feet.

Cat Island is the last of the chain extending to the westward, and forming the Sound. On its western point there is a light-house, with a fixed light; and on the main land, bearing nearly N. W. from the former, there is another light-house, also with a fixed light. These two light-houses indicate the passages through Pass Christian and Pass Mary Ann. To the S. W. of Cat Island are several keys, distant about 3 miles: (which are near the coast, and called St. Michael's Keys:) this channel is no where less than 15 feet; but within this part of the sound, vessels drawing more than 8 feet, cannot reach the Aux Malheureux Island, or steer to the eastward between Cat Island and St. Mary's Key, or enter the Bay of St. Louis; thus, between the island Aux Malheureux and this Bay, the sound becomes shallow and obstructed.

The impeded part of the sound, in the direction of Cat Island and the entrance of the Bay of St. Louis, is called Pass Christian; and does not admit of vessels drawing more than 8 feet at medium tide. This draft of water can be carried through Lake Borgne. From Pass Christian to Pass au Heron, 12 feet can be carried through the sound by keeping on the island side; but vessels drawing 8 feet must have the sound between Massacre and Horn Islands, and shape their course for the main entrance to Mobile Bay.

Lake Ponchartrain is separated from Lake Borgne by Pine Island, to the north of which is the entrance called Rigoletts, and to the south called the Chef Menteur; these entrances and outlets afford, on their respective bars, in Lake Borgne, a depth of 9 feet at high water, and 8 feet at medium tide. This depth can be carried through the lake within a short distance of the shore, to Madisonville, to the mouth of the Manchac, and to the mouth of Bayau St. Jean, which connects the city of New Orleans with the lake.

BAYAU ST. JEAN, on LAKE PONCHARTRAIN.—To enter the Bayau, bring the * light to bear S. E. ½ S. The entrance is on the west side of the light, and usual depth of water in the channel, 6 feet.

South, 15 miles from Dog Island, is the north point of the Chandelier Islands, which run to the southward, and with Grand Grosier and Isle au Breton, which bend to the S. W., nearly join the mouth of the Mississippi River. They will be described hereafter.

CHANDELIER ISLANDS.—From Passe a l'Outre, (one of the entrances of the Mississippi,) the coast doubles to the westward, and soon to the northward, to the parallel of 29° 27′, in which latitude lies Isle au Breton, which is a group of small keys, whose western limits are 5 miles distant from the coast, so that it forms a bay, called Poza Bay, in which there are 4 or 5 fathoms, with some shoals of less water. East of Isle au Breton, is the Isle of Grand Grosier, from which a ledge runs N. N. E., and breaks to the Isle of Palos, which is the southernmost of the Chandeliers. There is a good passage inside the Chandeliers, with 8 to 11 feet water, but a good pilot is requisite. From Isle au Breton a shoal stretches two miles S. W., bold at the very point. Shelter can be had from a N. E. wind inside this island, but the navigation is difficult for strangers, and requires much survey to describe it properly.

The whole of the Chandelier Islands are very low, with some myrtle bushes upon them, and form a chain of coast very injurious, and to be dreaded by navigators, not only that you cannot see them at a regular distance, but because the winds at S. E., (which blow hard in winter,) are right on the coast: nevertheless, there is good shelter for all ships to the westward of the north extreme of the Chandeliers, called the Road of Naso, where the heavy English men-of-war lay during the siege of New Orleans. This is the only good shelter for large men-of-war on the whole coast of Florida, (Tampa Bay and Pensacola for small sized frigates excepted,) not only because it is defended from winds on shore, but because there is no bar, breakers, nor impediment whatever, to your entering it in all weathers. To enter the Road of Naso, you have only to run so as to double the north point in 5 or 6 fathoms water, which will be one mile from the land, and then navigate from west round to south, keeping in 4, 5, or 6 fathoms, according to the draft of the ship, and you may anchor in 4 fathoms, when the north point bears N. N. E., distant 2 miles; but if you wish deeper water, you must not run so far south, but anchor when the north point bears E. N. E., in 5 to 6 fathoms water. In the Chandeliers, and almost the whole coast of the Mexican Gulf, you can get water by digging wells in the beach, but there is no other wood on the Chandeliers than the drift logs left in abundance on the beach. Its lands produce nothing but the myrtle, from which the green wax is produced.

North-westerly of the north extremity of the Chandeliers, 14 miles distant, is Ship Island; west of which, 8 miles, is Cat Island, and to the southward of this, various keys, called St. Miguel, run and extend out from the coast of the islands; between these and Cat Island is the pass into Blind Lake and Lake Ponchartrain, in both of which there is very little water, especially in Blind Lake. Between Cat and Ship Islands there is a large shoal running out from the east point of the first, which leaves a channel of less than half a mile wide, to enter to the northward of them; this channel has good 12 feet water; the anchorage is N. and S., with the west end of Ship Island ¾ of a mile distant, in 4 and 5 fathoms. Ship Island is long E. and W. and very narrow, and widest in the middle, which is partly covered with pines, but barren at both ends. The hurricane of 1819 cut a small channel through Ship Island, 1½ mile from its west end; in it is a well of good water, which is on its north coast, and about midway the island. East from Ship Island, 5 miles distant, lies the west end of Horn Island, and between the two lies Dog Island; from the first a shoal runs out to the east, which not only embraces the Dogs, but leaves a channel of only 150 fathoms wide; the bar has 2½ fathoms, when you immediately drop into 5 fathoms. East of Horn Island lies Massacre Island, then Dauphin Island, which is on the W. side of the entrance into Mobile.

GENERAL OBSERVATIONS.—The whole coast, from Mississippi to Cape St. Blas, sends off a bank of soundings to a great distance from the shore, whose edge runs out to latitude 28° 50′, but the depth is very unequal; this inequality is very clean. If you except the sand bank that lies in the vicinity of Cape St. Blas, you will find no danger in the whole of it that cannot be prevented by care and the use of the lead, and as

* The light-house is at the mouth of Bayau St. Jean, has one small fixed light, elevated 48 feet above the ordinary surface of the lake, and can be seen in a clear night about eight miles. It is 25 miles S. E. by E. ½ E. from the mouth of Cheninata River, 25 miles S. W. from the Rigoletts, 15 miles S. W. from Point Resence, and 5 miles north from the city of New Orleans.

the whole of the coast is very low, having few visible marks to distinguish it in its whole extension, and besides is often cloudy and foggy, exposed by the continuation of winds from S. to W., and from W. to N., which blow with great force in winter, and by hurricanes in August and September, all which create the necessity of saying something on the method of making the land, and navigating its coast.

NEW ORLEANS, MOBILE, AND PENSACOLA, are the three important points of destination on this part of the Gulf of Mexico; to go to either of which it is best to make well to the eastward of them respectively, when coming from any place S. E. of them; that is, when you have the winds easterly, which is the wind that predominates here; but if you come from the westward of them, you have no other resource but to beat to windward from that point of the coast which you have made, and the greater or less distance of it, according as you are best accommodated, with respect to the season, the quality and size of your ship, &c.

The making to the eastward of your destination is necessary to be more or less distant, according to the confidence and security you have in the situation of the ship, so that bound into the Balize, you will look for soundings in the meridian of 29° 30′, or thereabouts: and if bound to Pensacola or Mobile, in the meridian of Cape St. Blas.

Should you strike soundings in lat. 29°, steer N. W. by W. awhile, so as to make it E. northerly of it; that is, to make its bearing W. southerly, to prevent falling in to the southward of its parallels, especially in winter, when it is best to run heading for the middle of the Chandeliers: in this route you find no regularity in soundings, as whatever the parallel may be, you will as often get more water as less; nevertheless, from 20 fathoms down, the soundings are very regular; and from the meridian of Pensacola westward, to the southern limits of the Chandeliers, you will get 10 fathoms 10 miles from the coast; from Pensacola eastward, you have 10 fathoms at 4 miles from the coast, and 25 fathoms at ten or twelve miles.

But as navigating for the Balize, you may want an observed latitude, and have it so cloudy or foggy as to impede making the land, in such circumstances, or to run for it in the night, the soundings will serve as a secure guide, for which you must recollect that navigating to the westward, if you find 40 to 50 fathoms, loose mud, sticking to the touch, mixed at times with small black and white sand, it is a certain signal that you are in the parallel of the Balize, and from that depth to less water, you will always find the same quality of soundings, but if from 40 to 50 fathoms to less water, you get bottom of fine sand, with very little mud or without it, you will be in the parallel of between the Balize and Breton Key or Island: if you get small white sand, you are in the parallel of said key, and if coarse sand and snail shells, you will be in a parallel between said key and Chandeliers; and if you get coarse sand, with gravel, small stones, and large shells, you will be in front of the Chandeliers. From the Balize to the westward, the bottom is of sand alone: so that those from the southward who look for the Balize, sand alone will be a signal that they are west of it.

When navigating N. W. and N., from the getting 40 or 50 fathoms, sand, and in diminishing the bottom or depth, if the quality of soundings does not vary till in 10 or 12 fathoms, you are to the southward of the Balize: but if in this N., or N. W. route, you have crossed mud, or ooze, and entered in 10 fathoms, you find sand, then it is a signal that you have crossed the mouth of the Balize, and drawing in with Breton Island and the Chandeliers. The better to explain these soundings, we shall place them in form of a table.

In the parallel of the Balize. Crossing these soundings, you cross this parallel.	Loose mud, sticky to the touch, mixed at times with small fine black and white sand.
In the parallel of between the Balize and Breton Island or Key.	Fine sand with very little mud, or sand alone.
In the parallel of Breton Island.	Fine white sand.
In the parallel of between Breton Island and the Chandeliers.	Coarse sand and snail shells.
In the parallel of the Chandeliers.	Coarse sand, with gravel, small stones, and large shells.
West of the Balize, the bottom is sand alone.	

When you come in, looking for the Balize, either in its parallel, or that of the Chandeliers, you must take care not to get foul of the land at night, but maintain your posi-

tion, in 15 or 20 fathoms, at anchor or under weigh; but if you do not wish to delay for more safety, you may stretch in towards the Balize, to anchor in 10 or 12 fathoms, outside the bar.

If the running in for the land has been in the parallel of the Chandeliers, as soon as you get 10 or 12 fathoms, you will steer S. S. W., trying to maintain this depth, without danger of running aground, or among shoals, as is shown by the following breakage in the soundings:—

In this S. S. W. route there is, in the middle of soundings, a good mark to know the place of the ship, which is as soon as you arrive in a parallel with the S. end of the Chandeliers, which is as far up as Alcatraces, the depth begins to augment to 12, 14, and 18 fathoms, which is athwart with the Poza. This augmentation ceases as soon as you arrive abreast of Pass l'Outre, where you find anew the 10 fathoms; this knowledge is of importance in looking for the Balize with security, so as not to pass to the southward of it.

In running as above, be careful not to get into less than 10 fathoms, when stretching from E., or from S. to W., because from this depth to less, you cannot weather the Balize with the wind at E., and you have no opportunity for running for the road of Naso, as follows:—

Placed in 10 fathoms water, in a S. E. gale, (and no appearance of the wind's ceasing,) and getting into less water, you have the resource of navigating to the northward, sounding continually to maintain 8 or 10 fathoms, so as to coast the Chandeliers, and you will know you have passed the northernmost point; if you lose the oozy soundings, sometimes mixed with white shells, which is found off the Chandeliers, and finding fine white and black sand, you may steer W., and run in 10, 8, and 6 fathoms to anchor, under shelter in the road of Naso, as the atmosphere is cloudy; in such weather you can discover nothing, and to get to this anchorage, there is no other guide than the lead; but if you can see the land, you will easier get to the anchorage, as you have only to double the spit of sand which runs off the N. E. end of the Chandeliers, on which the sea breaks with easterly or south-easterly winds.

This convenient resource will be better if embraced as soon as you consider the passing or weathering the Balize doubtful, as here you have your choice of water from 3 to 7 fathoms, sheltered from winds, in 3 fathoms, from N. E., and in 7 fathoms from winds from E. round on the southern board to S. W. It is also necessary to advise, that as soon as the winds haul round to between W. and N., you should lose no time in getting out of this roadstead, as the water will fall from 4 to 6 feet.

It is a good rule in running for the Balize, to get soundings in any parallel between 29° 10′ and 29° 30′ or 35′, to get in 25 fathoms, from whence the Balize will bear S. W.; from 25 fathoms, in any parallel between 29° 10′ and 29° 35′, the Balize bears S. W., and by steering that course you will hit the Balize, about the N. E. Pass.

If your destination is Mobile or Pensacola, you should run in for the land, the eastward of them respectively, not only to avoid passing the port, but because landmarks are so wanting, and the coast so low, that a stranger has nothing to guide himself by, except the light-houses, the former of which shows two lights, one fixed, the other revolving, and the latter a revolving light, which may be some guide to the navigator; nevertheless, the soundings indicate sufficiently well the meridian in which the ship is found; a little more or less, if you attend to the quality of coarse sand and coral found outside of land, which is a sure indication that you are off the east end of Santa Rosa Island, where you find the same quality of soundings as off Tampa Bay and the other parts of East Florida, but can cause no equivocation, because the points are so distant from the one now treated of.

I am suspicious of a shoal or shoals near the edge of soundings, in about lat. 26° N., having once passed quickly through two colored patches, in about that latitude, and was clear of the appearance before I had time to sound. They looked like coral shoals, and I passed between them in a ship drawing 17½ feet. I had sounded in 45 fathoms water shortly before, and had no bottom shortly after.

Directions for the River Mississippi, and to prevent falling to the Westward.

Should you take your departure from the Tortugas, on one of which is a light-house, on leaving them make a N. W. course good, and you will fall into the latitude of the Balize, 20 leagues to the eastward; keep on to latitude 29° 20′, when you may steer W., or W. ½ S., to 25 fathoms, then haul to S. W. for the Balize, taking care not to pass its latitude in the night time, and you may make sure of seeing * Frank's Island light.

* On Frank's Island the light-house at the entrance of the River Mississippi is built. It contains a fixed light, elevated 78 feet above the ordinary surface of the sea, and can be seen, in clear weather, 6 leagues distant; your best course, running for the light, is due W., and vessels may safely anchor in 10 fathoms water.

The following bearings from Frank's Island light-house are the mean of a number of experiments by compass:

Should the weather be thick, keep in 16 fathoms, and you will fall in on Passe a l'Outre, where pilots are always stationed: but should you see the land, or vessels at anchor, if the wind will permit, haul to S. S. W., or more southwardly, and lead along in 12 fathoms.

Should it be very foggy, as it sometimes is in summer and fall, either anchor in 12 or 15 fathoms water, or stretch to the northward, as the currents to the southward of the bar set strong along the land to the southward, and by keeping to the southward you will be liable to be driven to the southward of the south point, in the latitude of which you will have 35 fathoms, within 3 miles of the land. A large bell has been provided, which will be kept tolling by night and by day, whenever from fog, or any other cause, the light or light-house cannot be seen at least four miles, at which distance it is calculated the bell may be heard in moderate weather.

In coming from the sea, the * S. W. Pass is said to have advantages, there being but few shoals. The water is very deep close to the bar, and the softness of the mud such as to do little harm to a vessel, even should she ground. Vessels, after making the light, are often blown to the southward of the Balize, where they have been known to lie embayed for days and weeks together. Ships drawing 16 feet have been taken over this bar without touching, whereas ships drawing 14½ feet water often lie on the S. E. bar for days. The N. E. and S. E. Passes are subject to changes, although much frequented by vessels of the largest class. From the S. W. Pass, 22 miles distant, the light on Frank's Island cannot be seen. Profiting of this pass, these delays may, in a great measure, be avoided.

The principal entrances to the Mississippi are the N. E. Pass, lat. 29° 07′ 25″, between 3 and 4 miles S. E. of the light; that of the S. E. Pass, lat. 29° 08′, 4 or 5 miles S. S. E. from the light; and the S. W. Pass, 22 miles from the light on Frank's Island; but approaching the Balize, you should keep 2 or 3 leagues to the northward, by which you will have good soundings to guide you. When you have struck soundings, you may run in the parallel above directed into 18 or even 16 fathoms, and you will then see the light-house on Frank's Island, and have the Block House or Balize bearing southwesterly: the anchorage is good every where, and should it fall calm, a light kedge will prevent being drifted by the current, which is sometimes pretty strong on the coast, but it is much stronger in the latitude of the river's mouth than elsewhere, and no soundings until you come close in with the land. In running from Passe a l'Outre for the main bar at the S. E. Pass, in the night, it is not safe to keep in less than 15 fathoms water; in the day time vessels may approach within 8 or 10 fathoms, observing to keep the lead going. Being off Passe a l'Outre in 15 fathoms, in order to go round the N. E. Pass in 10 fathoms, the course is S. S. E., distant 2 leagues; from thence to the anchorage off the bar, S. S. W., 1½ league. The Block House at the Balize bears from the best anchorage to wait for a fair wind to come over the bar, W. by N. ½ N., distant 2 leagues, where will be found 8 to 11 fathoms. At the entrance of the S. E. channel on the bar, the Block House bears N. W. by W., distant 5 miles.

COMMON ERROR OF STRANGERS.—Captains not acquainted on the coast, are frequently alarmed when they come near the river, by the appearance of the water, particularly during the first summer months, when the river is high, for at that time the fresh water of the river rushes out with great force, and being lighter than the ocean water, floats on the top, making an appearance altogether singular and alarming, for where the fresh water has not entirely covered the salt water, but leaving spots, it has the appearance of rocks, the river water being of a milky color, while the other is quite dark, and changes suddenly. When the river is low, the white muddy water extends about 3 leagues off, and when high about 5. On coming into it, it ripples like shoal breakers, but your soundings are regular.

ON THE SETTING OF THE CURRENT.—The current sets, with very little variation, to the east; and when any variation is experienced, it is either to the north or south of the river's mouth. It is very evident to every man of reflection, that so large a column of water, rushing into the ocean, must spread, when it is no longer confined, and produce different currents, until it has found its level, and will be found to vary from the original course, in proportion as you approach the edges: allowing the current to set due east, I have known two ships to come into the river at the same time, and the one

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Passe a l'Outre, N. N. W., distant 2 leagues; S. E. Pass, S. S. W., one and a half league.

S. W. Pass, S. W., distant 22 miles, but from it the light cannot be seen, on account of the cypress growth lining the sides of the pass itself, as well as the intervening mud banks, which are generally covered with bushes.

* At the S. W. Pass a light-house is erected, painted white and black in perpendicular stripes, showing two fixed lights, one elevated 30 feet above the other. It is on an island on the south side of the Nine Feet Channel, about three miles inside the bar, and left on the larboard hand on entering the river.

A light-house is also built on a shoal or island, near the south point of South Pass, showing a revolving light, which is left on the starboard hand going into the river. The building is painted black and white, in horizontal stripes.

complain of a southerly, and the other of a northerly current, and that because the one had been to the south, and the other to the north of the river's mouth; however, as every stranger should get into the proper latitude before he comes within the influence of its current, I do not think it necessary to say any more on that subject.

ENTRANCE OF THE RIVER.—The land at the entrance of the Mississippi River is nothing more than mud banks, continually increasing, with reeds and rushes growing upon it, at the height of 10 or 12 feet above the water. The light-house on Frank's Island, or vessels at anchor, are generally the first you discover. The general winds are from the N. E., and you should avoid getting to the southward. The winds make a difference over the bar, at the entrance of the Mississippi, and the general depth of water is from 11 feet 6 inches to 14 feet.

In lat. 29° 18′ N., you will strike soundings in 45 or 50 fathoms, small gray sand, with black specks. The Balize bearing W. by S. ½ S., 40 miles distant, when in 15 or 18 fathoms, soft sticky mud, you will see the Balize bearing S. W., if clear weather. With the Balize bearing S. W., run into not less than 12 fathoms, on account of some mud banks, scarcely discernible, above the surface, until the Balize bears W. N. W. and N. N. W. in 10 fathoms. The Balize bearing N. W. is good ground to anchor, and advantageous for getting under way to go over the bar. In foggy weather run no further in for the land than 15 fathoms, and it is preferable anchoring in light breezes to being drifted about by the currents, which are uncertain. From the bar, or entrance of the Mississippi River, to New Orleans, is 120 miles.

TO SAIL UP THE RIVER.—In sailing up the river, if you have a fair wind, run from point to point, carefully avoiding the bends, and by doing so, you will shorten the distance, have less current, and, what is of more consequence, you will avoid the danger of having your vessel sunk by the trees which frequently lie under water. As you are coming up to and passing a point, it will be well to heave a cast of the lead; with light winds, or when the wind is scant, always keep on the leeward side of the river.

ON COMING TO OR BRINGING UP.—Every vessel, while in the river, should have their boat along side, with a good hawser in it, according to the size of the ship, ready to run out to a tree, which method of bringing up is always preferable to letting go an anchor, for you are sooner under way, and avoid the danger of losing your anchors.

Every vessel, while in the river, should have a haulabout block lashed under the bowsprit to reeve a rope through, which rope should be bent to the crown of the anchor, in the same way as a buoy rope, and be strong enough to weigh it. The crown line should be of length sufficient, that when the anchor is let go, you may veer it away with the cable and always have the end on board, as by this means, if you should get foul of any thing with your anchor, (which frequently happens,) you will get it again; otherwise you will be obliged to cut your cable and lose your anchor. If you are obliged to let go anchor, it should be, if possible, at a point, for you will be more likely to find clear bottom. In the bends the bottom is always foul, being full of sunken trees, and there are few instances where an anchor need be let go in the bends, because you may always run a fast to a tree.

SHOALS IN THE RIVER.—About 3 miles above the Look-out-house, and opposite what is called the Pas Aux Cautres, (one of the outlets of the river,) there is a flat makes out a full half way over the river; this should be avoided by keeping near the psss, into which you must take care not to get drifted: this is what may be called the first shoal; the next is about 7 miles above the fort at Plaquemine, on the larboard side of the river, as you are coming up; to avoid it, you must keep nearer to the marsh on the starboard side; the marsh is the first land you come to without trees after leaving Plaquemine; here the land is very narrow, and by going a few steps up the shrouds, you may see the sea at not more than a musket shot distance; by these marks you may know when you are coming up with the shoal. The fort lies opposite the marsh, and runs full one-third of the way over; these are the only shoals that may be called dangerous, but, as I have before observed, the lead should be cast whenever you are approaching a point.

BOUND DOWN THE RIVER.—Vessels going down the river, should always have sufficient sail on them to be able to keep clear of the shore; without great care you will be driven into the bends and lose your rudder, and this has frequently happened with experienced seamen. I would observe, also, that every vessel, unless the wind is fair, and settled weather, should bring to at sunset.

We are confident that the great depth of water at the South West Pass will have more important bearings upon the commerce of New Orleans than all may imagine. It is decidedly the best channel, which has induced the government to erect light-houses at the entrance.

Going down the river, a slight inflexion to the right takes you to the head of the pass, which runs S. W. almost as straight as an arrow. The shores on each side are very bold, there being 7 fathoms water, in many places, almost touching the bank. A vessel

can often proceed this way, when it would be dangerous or impracticable to drop down the bend at the most frequented channel, past the Middle Ground.

About the same distance has to be gone over in order to reach the bar at the N. E., or Old Ship Channel, (via the Balize,) or to go down the S. W. Pass; but the course to the latter is direct, and there are no such dangerous shoals as the Middle Ground in going to it. The latter bar has 4 or 5 feet more water than the other, and the bottom is soft mud; whereas that of the N. E. Pass is rather hard and gravelly in many places. During flood tide there are never less than 18 feet water in the S. W. Pass, about 16 at low water. Variation, 6½° E.

COAST WEST OF THE MISSISSIPPI.—West, 47 miles from the S. W. Pass, is the east end of Timbalier Island; in this distance the coast bends to the N. W. and S. W., forming a bight in the coast, in which is the entrance to Barrataria Bay. The whole coast in this bight is low, and covered with a kind of rushes, with the exception of a few trees to the east of Barrataria Bay. The course from the S. W. Pass to the bar is W. N. W., and the distance 35 miles. In navigating between Timbalier Island and the S. W. Pass, you should not come in less water than 4 fathoms. The coast to N. E. of Barrataria takes a turn to the S. W., and you may know the entrance to the bay by a settlement on the east of the harbor. The bay is about 10 miles wide in every direction; its depth varies from 6 to 12 feet. On the sea side it is covered by Grand Terre Island, which leaves between it and the main two entrances, the eastern of which is filling up; and the western, called the Grand Pass, affords on the bar 9 feet water. To the east of Timbalier Island the La Fourche discharges itself by several mouths; a bar makes off from the east end of this island, in a S. E. direction, about 2 miles.

Timbalier Island, lies nearly E. and W., but bends to the northward at the west end. It is 10 miles long, and fronts a bay in which there are from 2 to 4 feet water. A shoal extends from its west end 2 miles, in a west direction, as far as the east end of Cayo Island, which is the next succeeding.

The east end of Cayo lies N. W. from the west end of Timbalier Island, 2 miles distant; it is 4 miles in length from east to west. Fresh water may be found on its east end, and likewise in a small bight to the N. W. part of the island. Good anchorage for vessels drawing 8 feet water is found at the east end; to take it, it is only necessary to bring the S. E. point to bear N. E., and steer for it, and with your lead for your guide, when near it, haul a little to the eastward, until the point is N., when you may steer and anchor as close to the island as you please. W. S. W. from Cayo Island, 1½ mile distant, is another island of above 2½ miles in extent, and 2 miles further, on the same course, is the east end of Vine Island. The shoal water extends some distance off the island lying between, and you should not come nearer the shore than 2 miles. Vine Island is about 6 miles long, running W. S. W., and is separated from Ship Isle by a small creek; Ship Isle is 11 miles long, and runs west until near its west end, when it turns to the N. W. Fresh water can be found at its west end, which is called Racoon Point. A shoal, on which the water breaks, lies W. S. W., 20 miles distant from Racoon Point, lat. 28° 53′; between the point and the shoal you will have from 4 feet to 2½ fathoms. A shoal likewise lies in the meridian of the point, to the southward, between which and the point are 2 to 5 fathoms. Vessels drawing 5 feet may anchor under Racoon Point, by bringing the point to bear N. and running for it, and giving it a berth of 200 yards; haul round the point, and anchor in 7, 8, or 9 feet water. The bays formed behind the islands last mentioned are shoal, having only from 2 to 4 feet water, and the shore to the north of them is marshy. Racoon Point is about 7 miles from the main, which runs about W. N. W., 41 miles, to Point Au Fer. This part of the coast is shoal, as at 2 miles from the coast you have 6 and 7 feet water, and for the whole distance it is marshy.

On Point Au Fer is a light-house, showing a fixed light, elevated about 70 feet above the level of the sea, lat. 29° 19′ N., long. 91° 52′ W., and serves as a guide for vessels going into Achafalaya Bay; it bears from Belle Isle S. S. E., 12 miles, and from the entrance of the river S. by W., 10 miles; from the outer buoy E. by S.; going in, the buoys are all left on the starboard hand, except in the narrows, where there are two, and you go between them.

From S. W. Pass to Belle Isle.

On leaving S. W. Pass steer W. by S. about 18 leagues; this course will carry you in 7 fathoms water off Timbalier; the coast from thence to Racoon Point, a distance of about 11 leagues, may be approached within one mile, or less. Near the meridian of Racoon Point is a bad shoal of hard sand, supposed to be distant 10 or 12 miles, as land could just be discerned from mast-head. It is always safest to pass between the shoal and Racoon Point, keeping the lead going. Give the point a berth of 2 miles, and you will have not less than 2 fathoms water. By a good observation this point is in latitude 28° 58′ N.; course from hence to Point Au Fer is about W. N. W. northerly, distant 15 leagues. It is best to keep the lead constantly going, and approach as near the land

as your draft of water will permit, say 10 feet, to avoid running past the light, as in hazy weather you can scarcely see the light in $2\frac{1}{2}$ fathoms water; latitude of the point 29° 19′ N. Bring the light to bear E. by S., steer W. by N. 7 or 8 miles, till you have Tucka Hummock bearing N. N. W.; steer for it till you have Belle Isle bearing N. E. by N.; then haul up into the bay E. N. E.; the stranger must then be guided by stakes, which designate the channel.

Rabbit I. Tucka Hum. Bayo Salle. Belle Isle.

One channel is to bring Belle Isle to bear N. N. E. and steer in for it, but this channel is intricate, and not generally used. Vessels drawing over 7 feet will find much difficulty in getting into the river.

The highest part of Belle Isle is 130 feet above the level of the sea. It can be seen at a considerable distance, there being no land resembling it on the coast.

ACHAFALAYA BAY and RIVER.—When you pass Racoon Point, steer W. by S. 6 miles, and you may then haul up N. W. $\frac{1}{2}$ W. for the point Au Fer; you will cross the bank in $7\frac{1}{2}$ feet water, when you bring the light-house to bear E. by N., steer N. 60° W. until Belle Isle bears N. by E., then N. 56° W. for the barrel stake; Belle Isle will then bear N. 36° E.; then steer N. 50° E., until the light-house bears S. 57° E.; steer for it until Belle Isle bears N. 12° W., from thence E. 3° S., until the light bears S. 32° E.; thence N. 47° E., until the light bears S. $\frac{1}{2}$ E.; thence N. 32° E. for Deer Island, at the mouth of the river; there are many stakes pointing out the channel and shoals, but little dependance can be placed on them, as vessels in coming up or going out often pull them adrift.

Vessels bound for the Côte Blanche, after passing the barrel stake, must steer for Rabbit Island until Deer Point bears north, then steer for it until up with it, thence N. by W. $\frac{1}{2}$ W. until up with the Canal of Bayou Salé; here vessels anchor.

FROM POINT AU FER WESTWARD.—The coast to the west of Point Au Fer is shoal for some distance from the shore, until you are up with Tiger Point, which may be known by a large ridge of high land, covered with oak trees. In this distance, which is about sixty miles, there is no navigation of consequence to the west of Belle Isle: a number of small islands and shoals to the west of Belle Isle and a large island bound the coast until within 10 miles of Tiger Point, and form behind them Vermilion Bay, which communicates with the sea at the east and west points of the island. This bay has from 5 to 9 feet water in it, and in the western strait, which is the clearest, there is a bar with 5 feet water on it.

Beyond Tiger Point the land runs west about 8 miles to the Bayous of Great and Little Constance, which have bars at their entrances.

From these Bayous the coast lies W. $\frac{1}{4}$ N. to the mouth of the River Mermentao, distant 15 miles: this piece of coast is swampy and without trees, but the beach is good; the river has from 4 to 5 feet water on the bar at its mouth, and the land for 2 leagues up the river is swampy; it thence rises and is well covered with wood.

W. by N. 30 miles from Mermentao is the river Calcasu, and 20 miles W. from the Calcasu is the mouth of the River Sabine and the boundary between the United States and Mexico: in all this distance there is a good beach, clear and without trees, but in some places it is swampy; the Sabine has a bar at its entrance with from 6 to 8 feet water. A shoal, having $3\frac{1}{4}$ fathoms, lies from the mouth of the River Sabine, E. by N. about 10 to 12 miles.

Courses by Compass from the S. W. Pass of the Mississippi.

To Racoon Point	W. $\frac{3}{4}$ S.	distant	33	leagues.
To clear the shoal of do	W. by S. $\frac{1}{4}$ S.	"	33	"
To Pass del Cavallo,	W. by S.	"	120	"
To Aranzas Inlet,	W. by S. $\frac{1}{4}$ S.	"	132	"
To Corpus Christi,	W. by S. $\frac{1}{2}$ S.	"	140	"
To Brazo de Santiago,	S. W. by W. $\frac{1}{4}$ W.	"	149	"
To Rio de Tampico,	S. W.	"	205	"

COAST OF MEXICO FROM THE SABINE WEST TO TAMPICO

The coast from the Sabine lies W., and then trends S. W. as you approach the entrance to Galveston Bay, a distance of about 50 miles, the whole of which is clean, having about 3 fathoms within a mile of the shore.

GALVESTON BAY.—The entrance into this bay is between point Bolivar on the N. and the east end of the St. Louis or Galveston Island, on the S.; between them are four channels.

Should it be your intention to go into Galveston Bay, be careful to haul to the south, when the wind is from that quarter, to avoid being hemmed in to the north, in which case you will be obliged to take the N. passage, which has but 7½ feet water, and will only carry you as far as the point: to take this passage you will keep along the north shore, and when near up with the entrance, leave a shoal which is dry at low water, south of you; you will have 8 or 9 feet water until nearly up with the point, when it will shoalen to 7½ feet, and soon after deepen to 9 and 10; continue along shore about a mile, when you will have 2 and 2½ fathoms; here you must anchor, as you cannot pass this next point with more than 4 or 5 feet, on account of a bank which extends from the dry shoal above mentioned, all the way south of you, until it turns quite round the point to the west. Here you are safe in a common gale.

Nearly a mile to the south of the above passage is another with 9 feet, the course into which is N. W., leaving the dry shoal on the starboard hand; and three-quarters of a mile south of this, is another, having 13 feet; the course into which is also N. W., and after passing the shoal, which lies to the south of you, you may steer direct for the north point of Galveston Island, and having passed the bar, you will have 3, 4, and 5 fathoms till up with the point, which pass within one hundred yards, gradually increasing your distance as you pass, when you will see the bank on the north bar, which is steep to; steer then to the S. W. up the channel in 3 or 4 fathoms, till you see a small bunch of bushes about two or three miles from the point, which bring to bear S. E., and anchor in 3 or 4 fathoms. Fresh water may be had near the bushes.

Should you wish to go in by the South Pass, keep along the beach of Galveston Island in 2 fathoms, until near the point, when you will not have more than 10 or 11 feet, haul round the point as before directed, and steer S. W. for the anchorage.

Galveston Island is about 20 miles long, and trends N. E. and S. W.; it is low, but you cannot mistake it, as there are three single trees about the middle; at the west end there is a wide pass with a small island nearly in the middle of it, and back of it, about 7 miles distant, is a long wood, called Oyster and Chocolate Dye Wood.

From the S. W. end of Galveston Island, the coast continues S. W., distance 15 miles, to the mouth of the Rio Brazos, and you will have 3 and 4 fathoms water at 2½ or 3 miles from the shore. As you come up with the mouth of the river you will see a long house on the N. E. point, called Michael's, and to the N. W. of the mouth you will see the Woodlands of Brazos, distant about 7 or 8 miles from the beach. The bar at the entrance has from 4½ to 5 and 6 feet water on it, but like all the other entrances it is subject to change.

At the port of Velasco, which is at the mouth of Brazos River, there are regular pilots well acquainted with their business, and a vessel drawing six feet water can enter the river without difficulty.

S. W. from the mouth of the Brazos 12 miles, is the entrance to Bayo St. Bernard, which is narrow, and has from 5 to 7 feet at times; as you approach it you will see the woodlands back of the beach at the distance of 8 miles.

In running down from Bayo St. Bernard for Pasa del Caballo, the land trenches somewhat in, but the general course is about S. W., and the distance 55 miles: you will pass a small bayo about 8 miles from St. Bernard. This bayo has a range of woodland which runs nearly to the beach, at the end of which is the bayo. After passing this, the land is low all the way, and you may keep in 3, 6, and 7 fathoms.

PASA DEL CABALLO.—As you approach this pass, which is in lat. 28° 19′ N. you will see a wide opening from the N. point, (called Point Clevry) between which and the S. point is a sand island. You will cross the bar about 5 miles distant from the N. point in 9 feet at low water, by bringing the south point to bear from N. W. to N. N. W. and steering for it; but you will always find some lumps on the bar, and your judgment must direct you. After passing the bar, follow the west breakers till you pass all, and then keep the south shore close on board in 2½, 3, and 4 fathoms, till you get up with a sand island which you will leave on your starboard hand, and having passed within two hundred yards, steer for the west part of the north point, as there is a low flat on the west side: in running here, you will have 2½, 2, and 3 fathoms; and as you approach the point, give it a small berth. You may anchor abreast of the island, or if you wish to proceed up the bay, give the marsh a small berth, in from 6 to 2¼ fathoms, as the ground is steep on both sides. Below the point, for the distance of two miles, is more flat; and if you wish to go to the Lavacker, run N. W. till you haul in under the south shore, and continue in 9 and 10 feet till you come up with the first oyster rock, when you must go ahead with your boat, and if bound to the mouth of the Colorado or Matagorda Town, continue along the marsh at the pass, keeping your lead going till you reach the Oyster Bank, which runs from the river to the sea beach, 5 miles, and from the pass 30

miles. This bar is subject to change, like the others, but for many years there has not been less than 9 feet at low water.

From Pasa del Caballo to Aranza Inlet, the course is about S. W. The land curves somewhat in, and the distance is 40 miles. It lies in lat. 27° 55′ N. All the coast is low; and when you get about half the distance, you will, in clear weather, see some woodland back of the bay, but nothing very remarkable on the coast. The entrance is very narrow, and not more than 7 and 8 feet at low water. The north point is somewhat high, with a low sand point stretching to the south point.

ARANZA INLET.—In going in, bring the south point to bear W. by S., or W. by N., and after crossing the bar, steer direct for the south point, taking care the tide does not affect you, as it is very strong, and you may go within pistol shot of the point, hauling to the north soon as you have passed it, and take your soundings in 10, 11, and 12 feet; or you may anchor soon as you pass the south point 400 yards, in 3 fathoms. If you intend going up the bay, continue in the above soundings, till you get up with the north point, leaving a long flat on the west. The channel is very narrow, and course about N. by E., or N. N. E., about 2 miles.

South of Aranza the coast runs S. W. by S., or S. S. W., to Corpus Christi, distant about 25 miles. The coast, after leaving the point 3 miles, is high and hilly all the way, with more dry sand hills.

S. by E. from the entrance to Corpus Christi, distant 92 miles, is the Barra de Santiago; and 10 miles farther to the south is the entrance to the Rio del Norte; midway between them is Boca Chica, which enters into the same lagoon as the Barra de Santiago, and on which you will have 4 feet water.

But few vessels enter the Rio del Norte, the trade to Matamoras being carried on through the Barra de Santiago, which affords a depth of 7 feet water on its bar, while the river affords but about 6 feet.

Directions for the Brazo de Santiago and the Rio del Norte, by Thomas M. Thompson, Branch Pilot.

In running down for the Brazos, between the months of March and September, be careful to keep to the south of 26° N., for should you fall in to the southward of the bar, you will find it very easy to make your northing, as a continued current is running northerly, of from two to three knots per hour. Should you fall in with the land, not having had an observation previous, so as to know if you are north or south of the bar, by going to the mast head you will see, if you are to the northward, a large lagoon of water, and scarcely be able to see the main land.

N. B.—This lagoon extends to the north of 28° 30′ latitude, and is a certain sign of your being to the north. If you are to the south of the river, you will find your water of a muddy green color, and no lake to be seen on the inside from the mast head. If your vessel is in the vicinity of the river, the water will be the same as approaching the Mississippi. If you fall in between the river and the bar of Santiago, you will be able to discern a large house, that stands on an eminence at the entrance of Boca Chica, a little narrow inlet, situated 5 miles south of the Brazos. Vessels bound here, between September and March, will do well to keep as near the 26th degree of north latitude as possible, as the current is then altogether governed by the winds. With the exception of an east wind, the current is northerly.

A white flag will signify that a vessel cannot enter, and will never be shown except there is danger in entering, and will be hauled down when the danger ceases.

A red flag will be hoisted to know your draft of water, which you can answer by hoisting your flag as many times as your vessel draws feet of water.

When a blue flag, it will tell you the pilot is coming out to take you in; or if you draw too much water, and will have to lighten.

A white and red flag will be hoisted for you to anchor, with two flags in a range, and in four or five fathoms water, and a lighter will be sent out to you immediately.

A white and blue flag signifies that you may haul off for the night, as it is too late to enter, but you will be attended to in the morning.

Any vessel appearing off the harbor in distress, will be promptly attended to, on making the usual signal, viz: the ensign, union down. I would recommend a white square flag with a large black ball in the centre, as a signal much quicker discerned.

Other directions for vessels bound to Texas.

From the S. W. pass of the Mississippi, steer W. S. W. one hundred miles, with the wind at S. E., to avoid the flat ground of the Oyster Bank, which lies off Vermilion Bay. This bank is large, and has from 2 to 3 and 5 fathoms on the outer part, and on the inner part 2 and 2½ a long distance: W. by S. course will cross this bank at times in 3 and 4 fathoms, soft bottom. As the current is so uncertain, it is almost impossible to know when you make your course good. After passing this shoal, you may steer for the Brazos without fear, and soon be on soundings again, and have from 16 to 20 fathoms, till

you gradually shoal your water to 9, 8, 7, and 6 fathoms. Should you wish to go for Pasa del Caballo, on a W. S. W. course, you will have soundings from 20 to 10 fathoms, 75 miles distant; and when in 8 fathoms, clear weather, you will see the land. In the latitude of Aranza, you will strike bottom, 22, 25, or about 30 miles from land, and shoal very gradually; and, when in 8 fathoms, you will see the land 20 miles in clear weather. More south, the water is much deeper; and you will have 7 fathoms close to the land, changing suddenly to 18 fathoms, 12 miles from land.

The course from the S. W. Pass to Barrataria is W. N. W., and distance 37 miles. Ship Island is nearly in the same latitude as the S. W. Pass.

The current on the whole coast is generally governed by the winds; but more rapid currents set to the south in a north wind than in any other. Vessels falling south of the port, with a north wind, will find it almost impossible to hold their own in a strong breeze. When bound to the eastward for New Orleans, your better way is to go no nearer the land than forty miles, until in the latitude of its entrance, as you will by that have no current to hurt you; but, on soundings and in shore, the current runs in moderate weather, regular ebb and flood, and the easterly current but a small part of the time. The tide at the passes, in common, rises 2, 2½, and in spring, 3 feet, and only in 24 hours; but it is altogether governed by the winds. In heavy winds on the coast, it is known to run in 36 hours, and sometimes 48; and on a sudden change of wind to the north, it will run out as long, in moderate weather. Sometimes there is a half tide, which rises nearly to high water, but seldom runs in.

From the Rio del Norte the coast trends S. 3° E., 7 miles, then S. 15° W. 29 miles, to the Barra de San Fernando or River Tigre, on the bar of which there are nearly 3 feet at low water; for the whole distance the land is low. The water of this river is brackish from the communication it has with the lagoon, and is only fresh after the rains; on the south coast of the bay formed by it, there is a good pool, where any urgent necessity may be relieved.

From Rio de S. Fernando the coast continues S. in nearly the above direction 23 miles to the Bocas Ciegas or Cerrados, which are four openings in the space of a league, and through which the sea enters when there are heavy gales: they may be distinguished 3 or 4 leagues at sea, and they communicate with Madre Lagoon, which extends nearly to the Barra S. Ander. The land from R. St. Fernando to Bocas Ciegas is low.

S. ½ W., about 24 leagues from Bocas Ciegas, is the entrance to the river St. Ander; the shore for the whole of this distance is low and sandy: on the bar there are 6 feet water, and the hills of Corrigo and Palma serve as marks for it, the bed of the river being midway between them, and forming in part, a large lagoon, whose shores are low. Eight leagues up the river is the town of Santa de la Marina. The lagoon, after the bar is crossed, and before you enter the river, is full of shoals, and you have only one channel of 11 or 12 feet water, but in the river you have 4 or 5 fathoms.

From the Barra de St. Ander the coast runs S. 3° E. 18 leagues to the Barra del Tordo; all the bottom is good in this distance, save that there are some detached rocks three leagues to the S. of St. Ander, where they extend 2 miles from the coast; on the Barra del Tordo there are scarce 3 feet at low water.

The marks for crossing this bar are those double hills called the Martinez, they lie west from it, and the N. W. of Martinez in the interior you can see the range of high land called Tamaolipas stretching in that direction.

South of Barra del Tordo 10 miles, is that of Trinidad. The bottom is good, except some pointed rocks here and there, none of which extend further than 2 miles from the shore. All the shore of this coast is sand or low hillocks, of which those about 2 leagues south of Barra del Tordo are of greater elevation than the rest, and are called the Hill of Chapopote or Comandante: on Barra del Trinidad there are but 2 feet water.

S. ½ E. 7 miles from Trinidad is Barra Ciega, and within a lagoon extending the whole distance. The coast is clear, save near the shore the bottom is rocky. West from Ciega Bar is the hill of Metate. Barra Ciega has 3 feet water on it.

From Barra Ciega to Tampico Bar the coast runs S. by W., and the distance is 19 miles. The coast is clear, save some pointed rocks which extend south of Ciega 6 miles, after which it is clear.

GENERAL OBSERVATIONS on the coast from Tampico to Galveston Bay. (From the Derrotero.)—The greater part of the lagoons that are formed on this coast have not more than 3 or 4 feet water, at their greatest depth, and some parts of them are quite dry except in the rainy season. From August to April, these coasts are dangerous, on account of the heavy sea upon them, and which makes it impossible for a ship to ride at her anchors; for in this season the E. S. E. wind blows with great violence for 2 or 3 days before it shifts to the north; but in the other months, from April to August, the navigation is very good and secure; the current always setting to the north and N. E., which facilitates increasing the latitude; and although the east winds prevailing from April to June send in much sea, yet a ship may ride at her anchors in 7 or 8 fathoms, in a case of necessity: in such a situation she will be in sight of the shore; but if possible,

it will be more advisable to keep under sail. The land breezes are frequent in the summer from midnight until 9 or 10 in the morning, when they yield to the sea breeze; but this only takes place so high as 26½ degrees of latitude, where the mountain range terminates; all the other parts are very flat, low and swampy; on which but little rain falls, which is the chief cause in producing the land winds.

We have followed the northern coast of the Gulf of Mexico as far as Tampico, it being more convenient to continue on thus far; we will now resume the description of the Gulf, commencing with Cape Catoche and ending with Tampico.

GULF OF MEXICO.

In this Chapter the bearings are the true.

GULF OF MEXICO.—The Mexican Bay is an immense gulf, surrounded or enclosed on all parts, except on the S. E.; the Island of Cuba advancing considerably to the west, forms, with this S. E. opening, two straits, or channels; one on the south with Cape Catoche, by which a communication is opened between the Gulf and the Carribbean Sea, and the other on the East, with the south coast of Florida, which communicates with the Atlantic Ocean, so that these are the only two routes leading into the Mexican Gulf.

CAPE CATOCHE TO POINT XICALANGO.—The N. E. land, or knee of Yucatan, has several islands at a short distance from it; these are Cancun, Megeres, Blanquilla, and Contoy; the last, which is the northernmost one, lies about 7 miles from the main coast; its shore is clear, and you may pass at 2 miles from it, in 6 fathoms: between it and the coast there appears to be anchorage; but this part is imperfectly known. The north point of Contoy lies nearly east, true, twelve miles from Cape Catoche.

Cape Catoche has two islets along its shore, which extend out scarcely a mile from it, and form, with the Island of Jolvos, two mouths, called Joujou and Nueva, fit for canoes only. From the said cape the coast bends somewhat to the south of west, for the distance of 18 miles, to the western extreme of Jolvos Island, which forms the Bocas del Conil: this coast is foul, having a rocky bank with little water extending off to the distance of 2½ miles. Between Jolvos Island and the main, a lake is formed, obstructed by various islets and grassy spots, and fit only for canoes.

From the Bocas de Conil, the coast continues to the W. by N., about fifty miles, to the Rio Lagartos, (Lizard River,) when it inclines W. 13° S., the distance of thirty-five leagues, to Punta Piedras, or Rocky Point. All the coast from Cape Catoche is very low and flat, without any remarkable objects upon it, excepting a Cairn, or little mount of stones, intentionally raised by the passing Indians on the very beach of Lagartos, 38 miles W. from Cape Catoche, which may be known by its resemblance to a hat, and the little woody hills, which are comprised between this and the Vigia, or Lookout, of the River Lagartos; next to it is that of Silan, where water may be procured with facility; to the Lookout of Silan follows that of Santa Clara, to which succeeds that of Telchaac, where, also, water may be procured; next comes that of Ygil, then that of Chuburna, and to this, finally, the Castle of Sisal. None of these Lookouts, (Vigias,) except the Cairn of Lagartos, and Castle of Sisal, can be seen farther off the shore than from 6 fathoms of water. From the Cuyo, or Cairn, at Lagartos, to Chuburna, you may anchor without fear, in from 4 fathoms, outward, but not nearer land, as there are many stones, shoals, and banks and rocks, which cannot be easily ascertained by the lead, because they are covered with a coat of sand, and thus they cut the cables, whereby anchors are lost; in addition to which the depth often suddenly diminishes upon them, and therefore vessels are in much danger of getting aground, and of being lost.

The Castle of Sisal is built on the shore, close to the sea, and near to it are three or four houses, used for depositing articles of merchandise, that are transported coastwise, to be taken to Merida; and also for receiving the produce sent from Merida and other inland places of this province. At the castle there is abundance of water, and it can be procured with the greatest ease.

Upon Point Piedras there is a little mount, named No-te-perderas, (Do not lose yourself,) and which is seen from Sisal Shoal, or at 14 miles off. From this point the coast rounds about to the S. W., for thirty miles, to Point Desconocida, forming the N. W. front of the Peninsula of Yucatan: this coast, as well as the former, may be seen well from 5½ fathoms of water, and is commonly named the Palmares; for, among the wood with which it is covered, many Palmitos, (Cabbage Palms,) are seen, though there are none on the other parts of this coast. On the coast of Palmares no one ought to anchor, for the bottom is of stones, covered with a thin coat of sand, which deceives the lead.

From Point Desconocida the coast trends to the south, but rather inclining to the

east, true, twenty-two miles, to Las Bocas, (The Mouths,) which are two little inlets formed by the coast; in front and very near to them are two very little islets. From the Bocas, the coast continues to the south, with some inclination to the west, true; to the distance of fifteen miles, or to Jayna, which is another inlet of the coast, at the mouth of a river; in front of this there is another islet; there is also an islet named Piedras, (or Rocky) Islet, half way between the Bocas and Jayna.

From Jayna the coast continues, with some inclination, towards the west, true, to the distance of twenty-one miles, towards the River of St. Francisco, which is four and a half miles to the N. E. of Campeche, the only point of commerce on all this coast.

The coast between Point Desconocida and the River of St. Francis, cannot be seen farther off than from 3 or 4 fathoms depth, and then it appears to the view with various breaks, which look like very low keys; all of it is remarkably shallow and clean; so that, with the lead in hand, there is not the least danger on the whole of it, excepting that which arises from the hull of a sunken vessel, which lies to the west of the Isle Piedras, and in 3½ fathoms of water, to which, vessels navigating in this depth, ought to give a berth.

From the River of St. Francisco, the coast continues to the S. W., for twelve miles, to Point Morros, in which space the Castle of St. Josef is the first thing seen; afterwards, the city of Campeche; to it follows the Castle of St. Miguel; next comes the town of Lerma; after it succeeds a point of the coast extending out to the sea, and which is named Point Martin; the next to it is Point Morros: all this front of coast, which forms the anchorage of Campeche, may be seen plainly from 4⅔ fathoms; but the water is so shallow that you will find 3⅔ fathoms at fifteen miles from the land, and 2¼ fathoms at 4 miles from it. The anchorage, therefore, needs no pilot, nor any particular advice for taking it; for, once arrived at the depth convenient for the vessel's draft of water, you may let go your anchor, remaining as if in the middle of the ocean: hence results an immense labor in discharging and loading cargoes; for even those vessels which can approach nearest to the land, remain 4½ miles distant from it. In order to diminish this labor, and to manage so that boats, lighters, or launches may go to and return from the shore under sail, they anchor to the west of the tower. In this anchorage, although open entirely to the north and N. W. winds, which in the season blow with great force, there is not any thing to fear, for they do not raise any sea of consequence, and vessels remain at anchor with sufficient safety,

To the west of Point Morros, and rather more to the south, it is not so shallow; and according to information, 4 fathoms may be found there, at a league from the land. Any one who approaches this coast, with the object of wooding and watering, ought to endeavor to take this last anchorage, in the vicinity of which, and somewhat to the south, is the town of Champoton, where they may provide themselves with the articles required.

From Point Morros, the coast trends S. 25° W., 36 miles, to Point Javinal, forming, as it were, a bend in the coast: as it approaches the latter point, the land trends more to the west, and S. 60° W., 61 miles distant from it, is Point Xicalango, which is the western extreme of the Lagoon, or Lake of Terminos. This lagoon is a great bay, about 40 miles wide, and having about 30 miles of bight: between its two outer and extreme points are two islands, which shelter it; the western, named Carmen, is the largest. At the western extremity of Carmen is a garrison, named that of San Felip (St. Philip.) Between this and Point Xicalango is the principal entrance to the lagoon, with rather more than 2 fathoms of depth, and of it we are informed only that it is very difficult to enter, and that it is absolutely necessary to have a pilot.

THE SOUNDINGS, OR BANK OF CAMPECHE.—The Campeche Bank is a great shoal, which extends from the north coast of Yucatan almost as far as lat. 24°, and from the coast of Campeche, to the west, as far as the meridian of 92° 30′; the depth as well as the quality of soundings on it are so uncertain, that it is not possible to ascertain your situation on it by the lead; it will be sufficient to take a glance at the chart to convince yourself of this fact; nevertheless, the soundings from 18 fathoms towards the shore are so regular, that you may navigate along it with all safety; for having once caught that depth, which you will find at 10 or 12 leagues from the coast, the depths will be found to run uniformly with the coast, until you are to the N. W. of Point Piedras, when it suddenly diminishes 2 fathoms. The same regularity is remarked all along these soundings, from 18 to 4 fathoms; and you will always find the diminution to the N. W. of Point Piedras, which is undoubtedly caused by some spit of rocks that extends out from the point; for upon it the soundings are always on stones. From 4 fathoms to the shore, in all the tract of coast between the Cayo, or Cairn of Lagartos, and the Look-out Tower of Chuburna, we have already said that there are various stones and shoals, most perilous to navigation.

The quality of soundings, from 18 fathoms towards the shore, does not preserve regularity; for sometimes it is gray sand with gravel, at others, gravel alone, and at others, sand with shells and coral; thus it alternates, until to the N. W. of Point Piedras, where, as we have already said, the soundings are on stone or rock, which make a very good

mark to know a vessel's situation by, and to enable her to shape a course with security, so as to pass between the Triangles and New Shoal, (Triangulo y Baxo Nuevo,) which is the channel that ought to be preferred for running off the bank on its western side; but it is still better to ascertain the vessel's place by the course which is necessary to preserve the depth of 18 fathoms; for, if you retain that, steering W. by S., it is a proof that you are between the meridians comprehended between the Cairn of Lagartos and Point Piedras; but, if you augment the depth on this course, it is necessary to change it to W. S. W. and S. W., it is a proof that you have passed the meridian of Point Piedras; and that you are abreast of the N. W. front of the coast, or between Point Piedras and Point Desconocida; and, finally, if, in order to retain the same depth, you are obliged to steer south, you need not doubt that you have passed, or at least abreast of, or on the parallel of, Point Desconocida. What we have said of 18 fathoms depth applies also to any lesser depth on this coast; but on the rest of the soundings, or bank, that is, from 18 to 20 fathoms, into deeper water, there is no regularity whatever, either in the depth of water or quality of soundings, especially on the north part of it; and this necessarily follows, for it is sown with shoals most dangerous to navigation, of which we shall speak in order.

THE ARCAS are three islets, which may be seen at the distance of 5 miles. They are the southernmost upon the western edge of these soundings, and lie almost nearly W. by N., 27 leagues from Campeche. They form of themselves a good harbor, which may be entered on the N. W. or S. side, as is most convenient, and without any other care than to avoid the spits stretching from them. The N. W. entrance may be taken by bringing the south part of the N. E. Island (which is also the largest) on with the middle of the S. E. island, bearing nearly S. E. by E.; this will carry you clear of a spit which runs out to the N. W. of the greater island, and which is the object that shelters the anchorage from the northerly swell. To enter by the south passage between the largest island and the westernmost island, you ought to be careful to avoid the reefs that extend from the large island to the S., and to the W. N. W., forming a shoal which bears from the south extremity of the said island N. W. ¼ W., nearly half a mile, and which forms the true channel between that and the westernmost area, of two cables' length in width.

The westernmost island sends off reefs to the W. N. W. and W. S. W.; also at 2 and 1½ cable's length from the north point of the large islands there are three foul reefs extending to the west, the farthest of which is 4 cables' length from the said point. This anchorage is very superior in northerly gales to that of Campeche; and as there is depth in it for all classes of vessels, he who, under such circumstances, can catch it, will find himself well sheltered and secure.

The S. E. Arca is surrounded by reefs, separated from it by a space of about a cable's length in breadth. This islet, with the reefs at the S. E. part of the large one, form a channel of two short cables' length, with from 5 to 15 fathoms, on sand, stone, and gravel, by which, in case of necessity, and according to the situation a vessel is in, an entrance to the anchorage may be attempted.

THE CABEZO, a head rock, which lies 13½ miles to the S. W of the Arcas, having only one fathom over it, must be cautiously avoided.

About N. 40° W. from the Arcas, at the distance of 7 leagues, there is a shoal of small extent, named the Baxo del Obispo, (the Bishop's Shoal,) on which it appears there is some rock that may be seen, but which cannot be discovered at more than 2 miles off by day, in clear weather, and with great vigilance.

Its situation has been well ascertained, and to be a flat rock or stone, with 5 fathoms of water on it, and so steep, that up and down at its edge there are 25 fathoms; and this causes the sea to break heavily on it; wherefore, at all events, it should be avoided. The Placer Nuevo lies 5 leagues N. 80° E. from the Obispo; on it there are 9 fathoms, and to this, also, a berth ought to be given.

TRIANGLE.—To the north of the Obispo is the Triangle, (El Triangulo,) which consists of three islets, lying about N. E. and S. W., in which direction they extend about 7 miles. They are visible at 7 miles distance, and send out spits and shallows, which render it improper to pass between them, or to approach them nearer than 2 miles to the W. N. W. of the northernmost. At six miles from the latter, there is another islet of sand, of about half a mile in extent, which is very clear on the south part, and which sends out a spit to the north; it is very low, and is covered with birds and some drift wood. The situation of these islands has also been accurately ascertained, and the Derrotero de las Antillas says the Triangle lies to the north of the Obispo, at the distance of 24 miles. It is composed of three islets, of which the two eastern are 2 miles distant from each other, but they are connected by reefs. The westernmost bears from the easternmost, which is the largest, N. 75° W., 8 long miles; and between the western and middle one is a channel, 6 miles broad, having from 17 to 30 fathoms, on sand, gravel, and rock. From the easternmost islet a reef extends, with a large rock above water, first to the N. N. E., and then to the N. W., forming a bow, or crescent, 2 miles in

length. From the north and east of the western island, shoals also extend to a short distance.

"The soundings in the vicinity of the Triangle are 18 fathoms, on fine sand, at 2 miles E. by S. from the larger islet: 23 fathoms, sand, gravel, and rock, at seven-tenth's of a mile; 26 fathoms, sand and clay, at nearly a mile to the S. E.; 18 fathoms, sand and gravel, at 2 cables' length to the south; 19 fathoms, from three to six-tenths of a mile to the south of the reefs which connect the eastern island to the middle one. To the W. S W. of the middle are 19 fathoms, on sand and gravel."

A sand bank lying about N. W., about 5 miles from the westernmost Triangle, on the Campeche Bank, was discovered by Capt. James, of the British ship Spey. This officer says, "at 4 P. M. he saw the Triangle Shoals from the mast head on the larboard beam, bearing S. W. ½ S., about 8 miles; shortly afterwards he saw a sand bank lying about N. W. from them. At 5 I passed them on the north side, and found it to lie in lat. 21° 2′ N., long. 92° 12′ 30″ W. This bank is very low, with a range of breakers lying out to the northward. It has a hummock in the middle like a small hut, and may be seen 4 miles in clear weather from the mast head. I tried for soundings at the distance of 3 miles north from the bank, with a line of 35 fathoms, without getting bottom. It must be, therefore, very dangerous in passing this bank at night, or even in thick weather in day-time, without being quite sure of the latitude and longitude.

BAXO NEUVO, OR NEW SHOAL, Gulf of Mexico. From Mr. George Peacock, R. N. This dangerous shoal lies in lat. 21° 49′ 30″ N., and long. 92° W. It is about 2 cables' length in extent, being a small key surrounded by rocks, the sea breaking frightfully over all. I have been close to it on two occasions, and had good opportunities of fixing its position with exactness.

KEY ARENAS is composed of a mass of coral heads, usually termed brain stones. The windward side is composed entirely of this coral, but the others are intermixed with fine and coarse sand. The deposite from the boobies and other birds has raised this mass to a height of 11 feet above the ocean, and on the southern extreme a beacon of stones has been erected, the top of which is 20 feet above the sea. Instead of a spacious bay, as in the admiralty chart, the anchorage is a miserable cove, in which there is scarcely room for three small vessels, and by no means a pleasant place to be caught with a westerly wind. A vessel should anchor under the windward reef, in 6 or 7 fathoms, in preference to this cove, and she will have sufficient room to get under way should the wind come from that quarter. Light variable winds and calms generally precede them.

The channels between the reefs are distinctly seen from aloft. Should the weather be dark, however, it is not so: then run with the extreme west end of Key Arenas bearing N. N. W. ½ W., until it subtends an angle of 85° with the easternmost, or Stony Key; or when this bears N. E. by E., then haul up, and choose your anchorage in 10, 7, or 5 fathoms, observing, close under the reef there is more shelter from S. E. winds, which at times throw in a heavy swell. Should the wind be at N., or N. E., run with the west end of the Key Arenas S. W. by S., until Stony Key subtends an angle of 95°, or when it bears S. E. by E. ½ E., then proceed as before.

The tides here are precisely the same as at Alacran. High water, at full and change, about 5 A. M., the fall being about one inch per hour. Lat. 22° 7′ 10″ N., long. 91° 24′ 30″ W.

ALACRAN.—From the survey of Don Ciriaco de Cavallos, in 1802, we supposed the port of Alacran capable of admitting small craft only. It is true a vessel drawing 11 feet may pass over the rocky heads between Perez and the South Spit, which make the entrance intricate, still, with the wind to the south of east, which it generally is in the morning, or rather before noon, a vessel drawing 18 feet may sail in. It is one of those harbors that can only be taken by eye, and from aloft every shoal may be plainly seen. A vessel entering should pass close to the South Spit, and run N. ½ W., until within a cable's length of Perez Spit; then haul close round it, keeping in the blue water, and anchor with the huts W. by N., one-fourth of a mile. The white water on Perez Spit can plainly be traced from the island, coming in from the westward, with the huts bearing N. and N. W. by N. There are heads, with 16 feet over them, a quarter of a mile off from the reef; therefore the eastern extreme of Perez Spit should not be brought to bear to the eastward of N. E. by E.

Alacran affords a very secure harbor, the dry reefs protecting it as effectually as would the land. The outside anchorage, two cables' north of the South Spit, in six fathoms and a half, coral sand, is very safe with all but westerly winds, which are rare, and give timely warning.

The tide, if it can be so called, is very remarkable. It was new moon, on the 25th of March, about 3 in the afternoon: on the following day the tide fell, from 6 A. M. to 6 P. M., 7½ inches, and the next day 13 inches, the wind being from E. N. E. to E. S. E., moderate. Again, on the 26th April, two days after the new moon, wind in the same direction, rather less, it fell 26 inches, from 7 A. M. to 6 P. M. This was a very unu-

sual tide, and several reefs were quite dry that were not seen before above water. We may suppose this rising of the waters in the morning to have been occasioned by the land and sea winds, (the few inches are scarcely worth noticing,) the mean height being about noon. On the plan, therefore, there may be sometimes a foot, more or less, than there shown. The fishermen, we found on a second visit, are supplied with water from the main land; a strong proof that it cannot be procured at Alacran. The dampness of the atmosphere was remarkable, the sails, wet with salt water, exposed to the burning sun for two or three days, would not dry, and the fog in the morning was regular and very uncomfortable. The main reef forms a regular segment, convexing to the N. E.; its base, or extreme length, tending N. W. by N., 14 miles. The lead does not give sufficient warning of approach; the abrupt descent from 20 fathoms to dry rocks is very remarkable, as are the shelves on the west side, from 7 to 24 fathoms in a ship's length. The nature of the deep water soundings is very fine sand; that called grey white and yellow is much of the same kind; a horn protractor laid on white paper will be the exact tint. This will be found the predominant color on the ground of Campeche Bank. To the eastward of the Alacrans there is no appearance of soundings, with a constant current to the N. W., from one to one and a half knot per hour. The dry sand bores are conveniently situated for our work. Three of the same stars as were discovered at Pajan's make the high north bore in lat. 22° 32′ 15″ N. These sand bores soon get covered with grass, samphire, and various kinds of herbs, when above water. The first formation of all is branches of dead coral. These are found by digging to the level of high water mark, and is probably the reason the Alacran does not contain fresh water. All the keys swarm with boobies and man-of-war birds, with their young. The only eatable kind are plovers and sand pipers. Fish of all kinds are very abundant, particularly grampus and rock cod. The fishermen dry them for the Campeche market; they had nets for taking them and the hawksbill. Turtle are also plentiful.

The Alacrans are in 22° 32′ 15″ N. latitude.
" " " 89° 43′ 00″ W. longitude.

ISLAND BERMIJA.—This, as placed in the old charts, is of very doubtful existence. The Lieutenants of the Navy, Don Miguel Anderete and Don Andres Valderrama, in their inquiries in search of the Negrillo did not see it. The same happened to Don Circaco de Cevallos in July, 1804, who purposely searched for it, for which reason we believe its existence is not true. Nevertheless, we have placed it in the chart in latitude 22° 33′, and longitude 85° 5′ west of Cadiz, (91° 22′ west of Greenwich,) until more elaborate surveys in every respect decide whether it exists or not.

THE NEGRILLO is a shoal spoken of by all who navigate these seas, but no one has been able to give the exact position of it. In the ship of the line San Julien, commanded by D. Juan de Joaquin Moreno, the deposition of the gunner, D. Manuel Sandoval, was taken, in which he declared that, being on board the ship of the line Buen Consejo, commanded by D. Joaquin Olivares, on his voyage from Vera Cruz to the Havana, and on the ninth day after sailing from the port, at 2 P. M., they saw breakers; that having sent a boat, in which the deponent went as bowman, to examine the spot, they discovered a rock of about half a boat's length of extent, and that he held on it with a boat hook, while others sounded over the stern with 120 fathoms without finding bottom, and which was repeated with equal diligence all round the rock with similar results; that over the rock there were not more than 3 or 4 palms depth of water, and that he heard the officers and pilots of the ship say that this must have been the Negrillo Shoal. In consequence of this declaration we have made many efforts to obtain this ship's log book, but without success.

SISAL SHOAL.—This Bank, (the centre,) lies in lat 21° 20′ 44″ N., and long. 90° 9′ 36″ W., in a direction N. 31° W., true, from Sisal Castle: the least water on it is nine feet, and it is about three-fourths of a mile in a N. N. W. and S. S. E. direction. In the channel, between it and the shore, are not more than seven fathoms, with tolerably regular soundings.

MADAGASCAR SHOAL is a most dangerous narrow coral ledge, lying in a direction nearly east and west, about a mile and a quarter long, covered with dark grass, and having, in one part, towards the western end, only nine feet. The latitude and longitude of the two extremes are as follows:

East end, 21° 26′ 06″ N., 90° 17′ 30″ W.
West end, 21° 26′ 18″ N., 90° 18′ 48″ W.

Its centre lies N. 42° W., 21½ miles from Sisal Castle; and in the channel, between it and the Sisal Bank, from which its centre lies N. 56° W., ten miles, there are ten fathoms water. The celebrated mount, No-te-perderas, the Spaniards' mark for keeping clear of Sisal, is becoming indistinct, in consequence of the destruction of the trees. These descriptions are from the surveys of Capt. Barnett, H. M. S. Thunder; the longitudes are farther to the westward than laid down in the charts, but we prefer his as more authentic.

Besides these shoals, others have been discovered: of which we have the following notices:—

The first, which we have distinguished by the name of the Argus, was seen by a lieutenant of the Spanish navy, Don Sebastian Rodriguez de Arias, commandant of the brigantine Argus; in sailing from Vera Cruz to Havana, at 2 P. M., 11th of July, 1818, being then in latitude 24° 2′, and in longitude 89° 43′ W., (from Greenwich,) discovered a breaker, which, on examination, disclosed a small bank, of about a cable and a half's length in all directions, with a breaker of from 12 to 15 fathoms, the centre, on which the water broke heavily, although the sea was otherwise very smooth, and the wind very calm. At mid-day the commandant had observed in latitude 24° 4′; and at 5 P. M. he found the longitude, by lunar distances, 89° 56′, both observations to be depended on, and corrected to 2 P. M., and referred to the situation of the shoal: he made it in lat. 24° 3′ 30″, and long. 89° 41′. This shoal appears to be the same which was seen on the 19th of November, 1800, by Don Narcisso Riera, captain of the Spanish merchant schooner Catalina, bound from Campeche to New Orleans; but, as his longitude was deduced from dead reckoning, we have more confidence in the position assigned to it by Arias; nevertheless, navigators sailing on this parallel, ought to be on their guard, lest the two dangers should really exist.

Don Manuel Bozo, pilot of the Spanish Bombard, Nuestra Senora del Carmen, in sailing from Vera Cruz and Terminos Lagoon, towards Havana, on the 8th of December, 1817, at day-break, saw a breaker or rock off the starboard gangway. The sea being smooth, and the wind moderate from the eastward, there was no doubt of its being a shoal, the extent of which he estimated at from two to three cables' length, extending N. E. and S. W.; and on its ends he saw two rocks or pinnacles, about three feet high, and his distance from it was from three to three and a half cables' length, where he sounded and found no bottom in 64 fathoms; and although he thought to examine it with his boat, he could not effect it, on account of the heavy break in the vicinity of the shoal; but he saw the spit of rocks of which it was composed, running the whole length of the danger. Having corrected his reckoning for 6h. A. M., the hour at which he saw the shoal, he found it lay in latitude 24° 6′, and longitude 91° 6′ W. of Greenwich. At noon, he observed in lat. 24° 22′ with certainty, and this was only one minute north of his D. R., and referring this to the shoal, by his run for 6 hours, he found its latitude by this to be 24° 7′, and longitude 84° 49′ W. of Cadiz; nor could there be any considerable error in his reckoning, in three days' sailing from the Vigia of Chuxulu, off which he had been at anchor.

This shoal appears to be different from the former, although its latitude is so nearly the same. The short time which intervened between his departure from the Vigia of Chuxulu and his making of the Tortugas Bank, when he found only thirteen minutes of error in his longitude by dead reckoning, shows that its situation as to longitude cannot be materially wrong. The shape and circumstances of the shoal, as described by Bozo, also show it to be different. Many old charts indicate a danger, with the word doubtful, almost in the same position, which also tends to confirm the belief of its existence.

In December, 1801, Don Dionisio Galiano passed over an extensive sand bank, exhibited on the new charts, which lies about 24 leagues to the eastward of the Negrillo, and having on its S. W. part 16½ fathoms. As it does not appear to be dangerous, it requires no further description. The situation seems well ascertained.

BAXO DEL CORSARIO, (the Privateer Bank,) has been explored by Don Ciriaco de Cevallos and Don Juan Lopez de Aguilla. It extends N. N. W. from the west point of the Island Jolvas, and has near it 10 fathoms water; there are breakers on it only when there is a heavy sea.

The last edition of the "Derrotero de las Antillas," says, the shallowest part of the Corsario Bank is situated, according to the survey of Don Ciriaco Cevallos, in lat 21° 37′ 30″, and long. 87° 15′ 30″, from Greenwich, giving it an extent of 3 miles from east to west, and about half a mile from north to south; its west end being on the meridian of the west end of Jolvas Island, four and a half miles distant. The shoal has been examined by the pilot Josef Gonzales Ruiz, who gives the following description:

"The Corsario Shoal is a rocky spit, which begins to the eastward of Mosquitos Point, with a turn of about 3 leagues to the north and to the westward of that point; it extends about N. W. by N., to that, or rather a less distance, and ends in 7 or 8 fathoms of water. All this bank is of rocky spots, which shoalen towards the land, until, at about 3½ miles from Mosquitos Point: at that distance there is a shoal extending about two miles east and west, and less than half a mile in breadth. This shoal, at low water, has 8 and 9 feet of water; and, at high water, 10 and 11 feet. Some of the rocks rise higher than others. The shoal is of mucara rock, with black spots, and some red ones, which seem to be sponges. Those spots farthest to the east bear from the west part of the island, (which is distant 2 leagues from Mosquitos Point,) N. N. E." It may be observed that

the situations given by this pilot do not accord with those of Cevallos, and the latter are supposed to be entitled to the greatest confidence.

These are the shoals which, down to the present time, have been known as existing on the Campeche Bank of Soundings. He who navigates on it in 18 fathoms, will go clear of the Corsario, Alacranes, and Sisal Reefs, and in a secure track for passing through the channels formed by the shoals on the western edge. Of all these channels the best is that between 21° and 22°, formed by the Triangle and New Shoal, (Baxo Nueva,) because it is the clearest, and we recommend it always to be taken by those bound to the west. The soundings which conduct the mariner through the middle of it, and clear of the shoals on each side, are tolerably regular; for, after he is to the north-west of Point Piedras, in lat 21° 40′, and having between 20 and 25 fathoms water, on fine sand, if he continues his course W. S. W. and W. by S., true, 18, 22, and 25 fathoms water, on fine white sand, will be found; and still continuing to the westward, in lat 21° 20′, there will be found 30, 42, 55, and 73 fathoms, on mud and soft ooze; and at a little distance farther you will be outside of the western edge, and clear of the rocks. In the first charts that were published in the Hydrographical Directory, and in the first edition of Derrotero, it is said,—"About the middle of this channel there is a bank with 26 fathoms water, on hard sand and gravel, having a patch of rock of 9 fathoms, which generally created some alarm to those who sounded on it, from exciting a suspicion of being in the proximity of some of the shoals." According to the last soundings and survey made in this passage, a bank of 24 fathoms, gravel, is placed in the latitude 21° 26′ 30″, and on the meridian of the New Shoal, (Baxo Nuevo,) without giving notice of the above quoted bank, which perhaps may exist. The chart published in 1799, places it in 21° 20′ latitude, and longitude 91° 44′ west of Greenwich.

Directions for navigating on the Campeche Soundings.

CAMPECHE SOUNDINGS.—It is undoubted that the eastern edge of this bank is an excellent corrector for the longitude of a ship: inasmuch as it runs nearly north or south, every one who gets soundings on this edge may consider himself as in 86° 20′ W. of Greenwich; and thus, those who sail from the eastward, to enter on the soundings or bank, ought to sound frequently, in order to catch bottom at the edge, or in its proximity, in order to have this correction of longitude.

But this excellent means of rectifying the longitude ceases to be so when there is great uncertainty in the latitude; for, as the water between Cape Antonio and Cape Catoche at times runs to the northward at the rate of 3 miles in an hour, it is necessary to allow for this, so as to enter on the soundings in a convenient parallel, that you make a course to the S. W.; and it is clear, that by steering about S. W., you may not only get soundings on the eastern edge, but on the northern also; in which case, having no certainty of the longitude, it would be very dangerous to direct the subsequent navigation by making courses to the S. W., in order to obtain the depth of 18 fathoms, and to pass at a proper distance to the east of the Alacranes. Such an attempt was the cause of the loss of a merchant vessel named the St. Rafael, which got aground on the eastern extremity of the Alacran Reefs, from which the other vessels of the same convoy, escorted by the ship of the line Santiago la Espana, passed about two miles clear. This loss, which happened in 1795, authorizes us in recording it, and in pointing out the necessary means of preventing similar mistakes in future.

Once on the bank of soundings, and having ascertained your latitude or situation on its eastern edge, you may make the rest of the navigation by it with much security; for placed on it, you have a mean of keeping a very exact reckoning, and free from the errors produced from currents. In place of a log-chip, in heaving the log, make use of a lead, for the lead, by resting firm on the bottom, will show the whole distance or rate that the vessel runs, whether that rate be caused by the wind or by the current; and marking the bearings of the line the opposite direction will be the direct course which the ship makes good, and which requires no further correction than for magnetic variation. It is true, that, if there be much depth, this practice will be very difficult; but, as in general, on this bank, you ought not to sail in more than 18 fathoms, and in the rest, from Point Desconocida to the shoals, there is no part so deep as 28 fathoms, there can be no reason why this useful method of ascertaining the vessel's place should not be adopted; nor is the frequent use of the hand lead of less importance; it ought to be constantly going.

Many neglect soundings, because they are not aware of its importance. If, in fact, a vessel which has to sound in 30 fathoms, has to take in sail, in order to heave the topsails aback, she cannot sound frequently; for, in doing so, half the day would be consumed in sounding; but it is well known that there is no necessity for so much work, in order to sound, even in more than 30 fathoms, as those well know who are expert in this part of their duty. In depths between 15 and 20 fathoms, the hand lead will be sufficient, and for this it is indispensable to have seamen acquainted with this work; without which every vessel might be lost that has to navigate over shoal places, on which, usually, the dangers are only discoverable by the lead.

DIRECTIONS FOR THOSE WHO NAVIGATE FROM EAST TO WEST.—1st. You ought to shape courses, so as to compensate as much as possible for the effects of the currents which prevail between Cuba and Yucatan, and so that you may enter upon the bank in 22° 15′, a little more or less. To be able to correct your course with judgment, and in good time, you should omit no means of observing the latitude, not contenting yourself solely with what the meridian altitude of the sun gives, but taking also those of any stars of the first magnitude, or of planets, when an opportunity offers.

2d. Attending to your reckoning, sound in time, that you may, at any rate, not pass far from the edge of the bank, without having obtained soundings on it; and, so soon as you have got them, correct your longitude by them, establishing thus a new point of departure.

3d. So soon as you are in 30 fathoms heave your log, with a lead in place of a log-chip, that you may thus keep a more accurate reckoning, and free from the effects of currents.

4th. In the season of the Norths, you should be directed by the depths of 18 or 20 fathoms, which you will find in the parallel of 22°. Sail on this depth until you are on the meridian of Point Desconocida, when you will steer W. by S., true, until you are on the parallel of 21° 25′, when you must run to the west, to pass between the Triangle and New Shoal.

5th. It is very advisable to know the latitude by observation, for passing between these shoals, or in default thereof, of being sure of the situation by your course, and the quality of the soundings N. W. of Point Piedras, which offer a good means of knowing the vessel's place; and, if both these data fail you, and you are in consequence doubtful of the situation of the vessel, you ought not to attempt passing between the shoals during the night, but keep in 18 fathoms, in order to take the passage by day, when you will run no risk, especially if you incline your course to the direction of the Triangle; for that, as we already explained, may be seen at the distance of 5 miles.

6th. If a north wind comes on, while you are on this bank, the only alarm you can be under is, while the vessel is to the eastward of the meridian of Point Piedras, when it will be necessary to carry sail sufficient to proceed to the westward, without departing much from the depth of 18 fathoms, in order that you may pass the said point clearly and without danger from the Sisal Bank or Shoal; but this offers no great difficulty; for there is little sea on these soundings, and as the winds from the north are generally free, with very little difficulty you may clear the point.

7th. If the navigation is made in the season of the rains, or from May to September, you may sail nearer the coast, in 11 fathoms; and you may also, from the time you are in 18 fathoms, abreast of the River Lagartos, steer S. W., true, with which course you will run to make the lookout tower of Chuburna; and thence, with your course parallel to the land, you will pass between it and the Sisal Shoal, without any other care than to keep in 4¾, 5, or 5½ fathoms, according to the vessel's draft; but with large ships, and not having to anchor at Sisal, it will be best to pass outside of the shoal; but, in so doing, be careful of the Madagascar Shoal, described in page 275. At this time it is preferable to leave the bank by the south side of the Arcas, and to effect this with more certainty, you will keep in the depth of 9 or 14 fathoms, until you cross the parallel of Campeche, when you will steer so as to leave the soundings in 19° 30′ or 19° 40′. The reason of approximating the coast more in the summer is, because having in that season many calms, with squalls and continual rains, which at times deprive you of observation for two or three days, it follows, that the navigation among shoals is very unsafe. On the contrary, near the coast they enjoy more land breezes, and the changes of the breezes are more certain.

8th. Until now we have supposed you to have entered on the bank with a good knowledge of your latitude, and consequently to have ascertained your position on the edge of it; but, if you enter on the bank with great uncertainty as to your latitude, which must always be the case when you are without observations for one or two days; in such a case, so soon as you have caught soundings, steer S. E., true, or as near to that as the wind will permit. With this course it is clear you will either catch the 18 fathom soundings, or you will lose bottom very soon. If the first happens, you will have attained your object by getting into the proper depth to navigate with safety; having happily freed yourself from the dangers of the Alacranes, upon which you would indubitably have gone with any south-westerly course, for you will have caught the soundings on the northern edge of the bank, and in about 88° 47′ W. of Greenwich. In this case, from the time you catch 18 fathoms, you will run to the west, in order to retain them; and you cannot be certain of your longitude until you are abreast of Point Piedras, in consequence of having failed of observing your true situation by the soundings on the east edge of the bank. If the second of these cases happens, namely: running soon out of soundings, not the least doubt can remain that you are on the eastern edge of the bank, and you must steer to the S. W. to get the 18 fathoms depth, as we have already advised.

9th. You may also steer to the west, taking soundings in 23° 30′ of latitude, and run-

ning along that parallel in 46 and 55 fathoms of water on a sandy bottom, keeping afterwards so as to pass to the north of the Bermeja; but we are very far from advising this route to be followed, from two reasons: first, because we have seen that there are well founded fears of shoals on the north edge of this bank, which as yet is imperfectly explored; and second, because, in the summer, you could not enjoy the advantage of the land breezes, and the changes of the breezes, which you might have in the proximity of the land, and your voyage would thus be rendered longer.

As we have said all that is necessary to be kept in mind for navigating on this bank from east to west, we shall now give some notices for sailing in a contrary direction.

DIRECTIONS FOR NAVIGATING FROM WEST TO EAST.—1st. It is evident that, to enter on the Campeche Bank by its western edge, nothing more is necessary than the latitude; for, running on a free parallel, you proceed without risk of shoals on the bank; and, whatever may be the error of longitude, you can correct it so soon as you strike soundings: but it must be remembered that the track between the New Shoal (Baxo Nueva) and Bermeja Island cannot be considered as clear, for we neither know the situation of the latter, nor are we even certain of its existence.

2d. Having entered on the bank, it will itself indicate when you are to the eastward of the shoals, which will be when you have less than 25 fathoms, and then the quality of the bottom will be of sand, if you have entered to the north of the Arcas; but if you have entered to the south of them, you will keep on clay to 11 and 9 fathoms.

3d. But if you have to enter on the bank while uncertain of the latitude, and in obscure weather, which occurs when the north winds blow, it is advisable to shun, as much as you can, entering on it by night, and endeavoring to do it by day, between the Triangle and Arcas, or it is even better to keep to the south of the Arcas, as a little more or less than the latitude by account will answer for this; but you must remember that the north winds always produce currents to the south; and from this you will always find your vessel more or less to the south of the reckoning. Under this circumstance you may expect the effects of the current to be about 18 miles in 24 hours.

4th. If in this case, when running to the east, you have soundings on the edge of the bank, you may continue to the east, although it be by night, so long as you find clay; but the greatest attention must be paid to sounding frequently, so long as you do not consider yourself to the eastward of the shoals, which, as we have said, will be soon as the depth diminishes to 25 fathoms. This remark is most essential, and of itself will save any vessel from being lost; for if, sounding in more than 25 fathoms, you find gravel and sand, or rock, it is an infallible sign that you are near some shoal, which known, you should immediately steer S. W., in order to get again upon the clay soundings, when you may steer again to the east; and so soon as you are past the shoals, and are to the east of them, you need take no other care than to steer in to the east, because the bottom is the only object you have to guide you, whether it be to go to anchor at Campeche, to lie to till a north wind blows over, or, beating to windward on the bank, until you can leave it by its eastern channel.

5th. Beating to windward on this coast is very easy, and the navigation expeditious, especially in April, May, June, July, and August, because in these months the winds during the day are changeable from N. W. to N. E., and the land breezes are from E. S. E. to S. E. during the night, with which you may navigate towards the east with very advantageous tracks, which tracks ought to be so managed as to stand off shore into 18 or 20 fathoms, with the land breeze, and turn towards shore with the sea breeze as far as 6 fathoms.

6th. On this bank the sea is very moderate, even with heavy north winds; and thus even a vessel which finds herself between the coast of Vera Cruz and this bank ought not to forget that when a north wind comes on, she may find security on it, either to lie to, in from 18 to 8, or 6 fathoms, or to anchor in 8, 6, or 4 fathoms, according to the draft of the vessel; and if she find herself in about the parallel of 20°, and is afraid of falling to leeward, and getting ashore on the coast of Tabasco, she ought immediately to prefer steering east, in order to get upon the bank and take advantage of it.

7th. We shall conclude these directions with one about the mode of leaving this bank, when you navigate from Campeche to the north, bound to any of the harbors on the northern coast of the gulf. In the manuscript directions, (drawn up by those who call themselves pilots for the Mexican Gulf, and which were the only ones until now,) it is recommended to steer north as far as the parallel of Sisal; you should then steer N. N. E. on purpose to run out between the Negrillo and Alacran, following the said course to the 24° of latitude: here it is proper to remark how arbitrary these directions are; for they are written as if the writers were certain of the situation of the Negrillo, which they were not; and even if they had known it, they ought (it seems to us) to have been a little more cautious in giving their directions, than to have advised passing by a strait formed by two shoals; of which, if the one is dangerous on account of its great extent, the other is no less so on account of its smallness, for it cannot be seen till you are almost on it. By following this route, the brigantine, in which went the mariner, by whose account

we have placed the Negrillo, got within it; and it is very wonderful that this shoal has not proved more fatal to navigation by causing the loss of many vessels.

It appears proper to us to advise, that those who wish to leave this bank, by its northern edge, should steer to the north, and so as to pass to the east of Arenas Island; and leaving the bank at such an hour as to be able to cross the parallel of 23° 30′; with daylight they ought to keep the same course, until they pass that of 24°, when they may shape their course as convenient.

To Campeche, by Capt. John Mackellar, of the British Navy (1817.)

If bound to Campeche, get into the latitude of 22° 0′; then steer W. ½ S., 100 miles, sounding frequently, and having good soundings on the bank. You may then, with great confidence, keep in the soundings laid down in the chart, either in going within the shoal of Sisal, or without it; but, in fine weather, I should always prefer making the land to the eastward, and then run down along the coast, in 5 or 6 fathoms. On approaching Sisal, keep the land freely on board by your soundings; and, in doing so, you avoid the risk of running on it, either by day or night, for you will see the castle of Sisal 5 or 6 miles off, and you may run down in 5 or 6 fathoms. The great advantage of this will be, the certainty of land winds off shore, from about 4 o'clock in the afternoon until 7 or 8 the next morning; the sea breeze setting in generally from the northward and eastward. If you are in a vessel drawing more than 12 feet water, avoid a shoal laid down in the Spanish chart, on which 2½ fathoms only have been found: this shoal lies off the village of Jayna, about 10 miles, which village, or any part of the coast, cannot be seen off deck; therefore great caution is necessary in running for, or leaving Campeche.

The town of Campeche is situated in lat. 19° 51′ 15″ N., and long. 90° 28′ 15″ W. of Greenwich. Proceeding for the anchorage from the northward, and having advanced towards Point Desconocida, on the N. W. part of Yucatan, distant from it 8 or 9 miles, your depth of water will be from 5 to 6 fathoms; from this proceed to the southward, about S. by W., observing that you must go no nearer to the shore than 6 fathoms, until you are as far as the lat. of 20° 0′ N.; then, being in that latitude, and your depth of water 6 fathoms, if clear weather, you will see the land, which is very low and difficult to make out; from this, if the wind will allow you, steer E. S. E., or S. E. by E., until you make the land out plainly. There are two large white forts, one, Fort St. Michael, on the top of the hill, which will first be discerned, and it may be seen in lat. 19° 56′, in 5½ fathoms; and another, recently constructed. St. Michael is the fort nearest Lerma, and Lerma is 5 miles west of Campeche. Keep fort St. Michael E. by S., or E. S. E., and as you approach the land, the new fort will be discovered on the beach; and when this fort is in the range of Fort St. Michael, keep them so, and run in within 6 miles of the land; you will then have 2¼ fathoms, which depth you will carry 2 miles; then you will have 2½ fathoms for 1 mile, and, as soon as you again have 2¼ fathoms, come to an anchor. When you have 4¾ fathoms, the steeples of Campheche are just in sight, from a frigate's deck; and when in 4½, the church at Lerma can be seen from the deck: the Point Morros, which is the S. W. extreme of the land, will bear S. S. E., and Campeche E.; and when in 24 feet, which is the depth I should propose for a frigate to anchor in, the tops of the houses at Campeche are just well in sight from the deck, bearing S. 83° E.; Fort St. Michael S. 73° E; Lerma Church, at the bottom of the hill, S. 66° E., and Point Morros, the S. W. extreme of the land, S. 19° E.; your distance from the town will then be 9½ miles, and lat. 19° 53′ 47″, and long. 90° 37′ 30″ W. Should your ship be of less draft of water than a frigate, proceed on for Fort St. Michael, keeping it bearing as above, and anchor in what depth you please, but within 3½ fathoms; in this direction the bottom is bad, being covered with large shells, and, of course, dangerous to anchor in.

In the event of running for Campeche, in hazy weather, which often is the case on this coast, in the fore part of the day, I should recommend proceeding as follows: After you reach the lat. of 20° 0′ N., haul up to the E. S. E., keeping your lead going; and, should you not see the land, endeavor to get into the lat. of 19° 54′ before you are in less than 4½ or 5 fathoms water. So soon as you consider yourself in this latitude, proceed to the eastward, until you shoalen your water to what may appear best to anchor in; taking care, if you have to beat up, not to pass to the southward of 19° 52′, nor to the northward of 19° 56′, for between these two latitudes is the deepest water, and anchor as near the latitude of 19° 54′ as possible.

In lat. 20° 12′, and long. 90° 41′, there is a small spot of ground with only 15 feet of water on it; but, running along shore, and keeping in 6 fathoms, you will pass to the westward of it: the soundings near this part are very irregular, altering sometimes a fathom and a half between two casts; there is no other part on the bank where this is the case.

The town of Campeche is a walled town, with four gates, N., E., S., and W.; the north gate leads into the town from the sea by a pier of about 50 yards long; but the water is so

shallow that small boats only can land, and then only at high water; the rise is about three feet.

Though Campeche is walled, it has only a few guns on each angle; the military force does not exceed 500; the town is abundantly supplied with all kinds of stock and Indian corn, but no water except in tanks. The principal wells are at the south gate about half a mile, and that not good. The population appears great, and the natives active and well made.

During my stay, (from June 10th to July 10th, 1817,) I observed the tides were very irregular, and greatly influenced by the wind; so that ships (with the wind off shore) must pay attention, if drawing much water, to get under way, and run out farther into deeper water. On the 2d of July, the Fame, then drawing 17 feet, and lying in 3¼ fathoms, grounded with an off-shore wind, and in a few hours had only 14 feet along side; and for three days never more than 16½ feet, until the wind shifted to the northward; and had she not been a remarkably strong vessel would have strained very much.

Vessels with hempen cables ought to be careful in picking out a clear berth, as a number of vessels were formerly in the habit of heaving out stone ballast where they lay; this is now prevented, by a fine of 500 dollars being laid on a vessel that does so. Sand ballast is allowed to be thrown overboard, by shifting the vessel often, so that there is no danger of banks being formed by it.

PORT LAGUNA.—The port of Laguna, or town of Carmin, as it is called by the Mexicans, lies on the west end of the Island of Carmin, about one mile within the S. W. point of the island. The bar makes out from 5 to 6 miles from the S. W. part of it, in a N. W. direction. The latitude of the point is 18° 38′ N., and long. 91° 49′ W., by the mean of three chronometers; lat. of the middle of the anchoring ground 18° 37′ 12″, the S. W. point bearing N. W. ½ W., by compass, a short mile distant.

Ships bound to Laguna should endeavor to make land to the windward; if they fall in with Port Royal, it may be known by an island lying in the middle of the entrance, which is precisely the plan that Laguna is laid down on the common charts; but it is a mistake, as there is no island to be seen at the Lagoon, but a sand bank, which the sea breaks all over in rough weather, which cannot be seen until you come into 3 fathoms water on the entrance of the bar: the middle part of the sand bank bears N. W. ½ N., by compass, about 3 miles distant from the S. W. part of the island. Inside of the sand bank is a passage for small craft.

Run down the Island of Carmin at 4 or 5 miles distant in from 4½ to 5½ fathoms, sticky bottom, all the way from Port Royal, but to the east of Port Royal, you will have hard bottom, after getting into 7 or 8 fathoms.

The entrance of Laguna does not open until it bears south, but if any shipping are in port you will see their masts over the land before you open the harbor.

To go over the Bar.—After opening the harbor part off shore until Cape Xicalango bears W. S. W. by compass, three miles distant, then steer for it, but keep your lead going, and come in no less than 3 fathoms, until a small Indian village, on Xicalango Island, bears S. or S. ½ E. by compass, then steer directly for it, and keep that bearing until the Church in the centre of the town bears E. by compass, then haul up for it and anchor before the town, near the shore as you please.

There are from 12½ to 13½ feet on the bar, hard mud; pilots come off with the land breezes in the morning, in canoes, with one or two sails.

Strangers had better anchor in 3 or 4 fathoms, after opening the harbor, and wait for a pilot. The water shoalens quick after opening the harbor, from 5½ to 3½ fathoms, but there is no danger by keeping your lead going.

THE COAST FROM POINT XICALANGO TO VERA CRUZ AND TAMPICO.

Courses in this Chapter the true Courses.

From Point Xicalango the coast trends about W. a distance of 32 miles, to the River of San Pedro: and all this part is called Lodazar, (Mud Bank,) because the bottom is of mud so soft and loose, that there have been instances of ships having been driven upon it by the norths without receiving much injury in their hulls. The land is high, and is called the Altos, or Heights of San Gabriel.

From the River San Pedro it is S. 75° W., 55 miles, to the River of Tupilco; the coast between forms a bight of about 5 miles in depth within the line of bearing, and has in it the River Tabasco, that of Chiltepec and Dos Bocas, or Two Mouths. The bars of San Pedro and Chiltepec have 7 or 8 feet water over them; there are 4 feet in the Dos Bocas and Tupilco. That of Tabasco, which is the deepest, forms two mouths, separated by the Isle del Buey, or Ox Island: the easternmost of these has 7 feet, and the westernmost 9 feet water: all these bars are subject to shift, excepting that of San Pedro, which is fixed about midway between the two points of the river.

Buey Inlet varies from 8 to 11 feet, fine white sand; you can always get a pilot. Ten

miles to the eastward the palm trees commence very thick. The town of St. Juan Baptista is 75 miles up the river; and 12 miles from the bar the river forms three branches, on the westernmost of which the town is situated.

From the River Tupilco the coast forms a bight or bay as far as the bar of the Lagoon of Santa Ana, distant from the former 31 miles, S. 52° W.

All the coast, from Xicalango to Santa Ana, is clean; so that, from the Lodazar to Chiltepec, there are 4 or 5 fathoms at a mile from the shore, and 10 miles between Chiltepec and Santa Ana: the quality of the bottom between Lodazar and Chiltepec is mud; between Chiltepec aad Dos Bocas, mud and rotten shells; from Dos Bocas to Tupilco, coarse olive-colored sand, and between Tupilco to Santa Ana, coarse sand with shells, and in some parts gravel. There is mud in the mouths of all these rivers as far out as the heads or points of the bars. The whole of the shore is rather low than otherwise, and from about 2 leagues to windward of the San Pedro to the Chiltepec, it is covered with palm and mangrove trees, and thence to Santa Ana, with mangroves and miraguanos.

From the bar of Santa Ana west, 25 miles, is the River Goazacoalcos, and in the intermediate space, the River Tonala discharges its waters.

The River Goazacoalcos is known by its east point forming a scarped morro, or hill, the west point being very low. S. 34° W. from the said east point of the river, at the distance of 4 miles and four-tenths, there is, on a height, a vigia, or lookout tower, with a house at its foot, which serves as a warehouse or magazine of gunpowder; and somewhat more to the east, a corps de garde with a battery, which has a flag staff at its east part, and which serves as a mark for the bar of the river. When this bears S. 13° 30′ W., it will direct you over the middle of the said bar, the least depth of which is 2¼ fathoms, increasing as you pass it from 7 to 13 and 15 fathoms.

At the distance of 13 miles west from this bar is that of the River Barrilla, which, with the River Goazacoalcos, forms an island called Barrilla.

N. 20° W., at the distance of 10 miles from Barrilla, is the point of San Juan with an islet, and at N. 35° W. from it, distant 17 miles, is that of Zapotilan, from which it trends N. 49° W., for the distance of 11 miles, to the Point los Morrillos, and afterwards N. 59° W., 7 miles, to Roca Partida. West from Zapotilan Point, distant one league, is the boca, or mouth of Soutecomapa Lagoon, and S. S. E. from Point los Morrillos there is a vigia, or watch-tower. The coast between Barrilla and Roca Partida forms the base of the sierras, or mountains of San Martin, on the highest summit of which is the volcano of Tuxtla, which broke out in March, 1793, and whence eruptions still continue. This mountain can be distinctly seen at Vera Cruz, which is distant 25 leagues. When it is in an active state, the flames by night, and the column of smoke by day, afford an excellent landmark.

ALVARADO.—N. 86° W., distant 27 miles from Roca Partida, lies the bar of Alvarado, which, though it has not so great a depth of water as that of the Goazacoalcos, will admit vessels of 9 or 10 feet draft. On the intermediate coast is the vigia or lookout of Tuxtla, and that of Barrancas.

The entrance to Alvarado is very narrow, and cannot be seen until bearing S. by E. to S. by W. It is, however, known by a remarkable sand bluff, and appears thus:

S. 15° W.

Vessels bound here, on making the usual signals for a pilot, by firing a gun and hoisting colors, will be furnished without delay. A pilot proceeds from town in a pirogue, or canoe, manned by 8 or 10 men.

The anchorage off the bar is indifferent, and after the month of September, very dangerous, as should a ship be caught here in a north wind she must inevitably go on shore, unless she can cross the bar, and that can only be done by vessels drawing 10 feet or less. These winds come on so quick, and a current runs so strong to leeward, that it is very improbable a ship would work off the coast.

During the rainy season the current runs constantly out of the river, and it requires all the sail you can make to cross the bar: if the ship should be of such draft as to render it uncertain, a person should be procured from town, who could talk with the pilot fluently, as the least mistake might be fatal. In 1824 I crossed this bar without touching, drawing 11 feet, in a very fast vessel, while a dull sailer of less draft directly struck and went to pieces.

The anchorage, after you are in, is good, and about 2 miles from the bar, directly opposite the town.

N. 44° W., distant 21 miles from the bar of Alvarado, is the River Salado Chico, which is the southernmost part of the anchorage of Anton Lizardo. All this coast, from the River Santa Ana to the River Salado Chico, is equally clear as that to the eastward,

and on all that part on which we have written, from the Lagoon of Terminos to the last mentioned place, it is very dangerous to anchor from October to April, on account of the norths blowing directly on the shore; and it ought not to be approached with any vessel that cannot enter over the bars which have been described; for it might easily happen, in spite of all exertions, that you may be driven upon the coast, seeing that the norths are very strong, and with them there is no way of getting off.

The anchorage of Anton Lizardo, which is distant 12 miles from Vera Cruz, is formed by various shoals and reefs, with clean channels between them, of very easy access, especially when a fresh wind causes the sea to break on the shoals. These shoals, although they afford no shelter against the winds, break off the sea so much that ships ride very safe and securely at their anchors, even during the hardest north gales. The anchorage is spacious, and fit for every class of vessels, for which reason, and because with the norths, it is to leeward of Vera Cruz, a thorough knowledge of it is of the utmost importance to those who cannot reach that port with those winds.

Captain Don Francisco Murias surveyed and drew a plan of the place in 1818, which is published by the Hydrographical Office, an inspection of which is sufficient to obtain a knowledge of its goodness and excellence. We copy what Murias has said on it: "To go into this anchorage, although it has four excellent entrances of a sufficient depth of water, the two which are formed by the rocks with the coast should be preferred, and of these the western one is always the best. In taking this channel you ought to steer about midway between the coast and the Island Blanquilla, in which case steer east, and continue on that course until you are somewhat within it, when you must steer more to the northward, in order to take a berth most convenient for your purpose. The best anchorage is to the N. E. and E. N. E. of Point Anton Lizardo, (on which there are some houses,) in 10 fathoms, on gray sand, and sand and shells."

The holding ground is excellent, being formed of thick sand and clay; and from this circumstance of the wind on this part of the coast never blowing any more than a fresh breeze from any quarter except the N. and N. N. W., the anchorage is as secure as most harbors.

Ships, in approaching Anton Lizardo from the southward, should be particularly careful to avoid the outer shoals, which lie to the N. E. of the anchorage, about 9 or 10 miles, and are dry at low water; and as the tide rises seldom more than 4 feet, must be dangerous at all times.

In approaching the land, in the winter season, there is frequently a haze which prevents you from making it out, until you are close upon the shoals; it is, therefore, much safer for ships to make the land to the northward.

N. 27° W., at about 4 leagues distant from Point Anton Lizardo, is the castle of San Juan de Ulua, which forms the Harbor or Port of Vera Cruz, which is more known and frequented than all the others in the Mexican Gulf, and likewise the most dangerous to take, particularly during northerly gales. It is not a commodious harbor, but an open roadsted, covered with several islands, on one of which the fortress of St. Juan de Ulua is erected. The access to this port is difficult, but we subjoin such directions as we are in possession of.

The principal landmarks to vessels advancing towards Vera Cruz, are the Peak of Orizava, and the high land to the north of it, called the Cofre de Perote, both of which are far inland to the westward of Vera Cruz. Still further from the city is the volcano de Tuxtla, on the eastern part of the sierras or mountains of San Martin, and bearing from Vera Cruz S. E. by E., about 78 miles distant.

The Peak of Orizava is in lat. 19° 3′ N., and 61 miles W. 9° S., true, from Vera Cruz. It is of a conical form, and always covered with snow. This mountain burst forth in 1545, and continued in action for 20 years, since which time there has been no appearance of combustion. Its height is 2,981 English fathoms above the level of the sea. It may be readily known, as it shows in the form of an isosceles triangle, and may be seen at the distance of 25 leagues from the coast.

The Cofre de Perote is 2,332 fathoms above the level of the sea. It stands in lat. 19° 29′ N., about 13 leagues from the nearest part of the coast. It is the highest of the mountain range to the north of Orizava.

Directions for Vera Cruz, by Capt. John Mackellar, of his Majesty's ship Pique, 1817.

The harbor of Vera Cruz is formed by the walls of the town on the south side, and by the walls of the Castle of San Juan de Ulua, where the light-house stands, on the north. The castle is built on an island opposite the town, and has a large reef of rocks running off from it to the N. E., nearly 2 miles. This reef is called the Gallega, and always shows a part above water. The harbor is bounded on the S. E. and E. sides by three or four small islands and reefs, with good passages through between them. On the N. W. side is the principal entrance, on account of the ships getting easier in and out; and that is the only side which is clear and open to seaward.

1. The town is situated in latitude 19° 12′ 34″ N., and longitude, by chronometer, 96°

10′ 30″ W., by sun and moon, 96° 8′ 30″. The variation of the compass is about 6° E. This port has a very good revolving light on the N. W. of the Castle of San Juan de Ulua; the centre of the lantern is elevated 79 feet above the level of the sea, and the light is on the same principle as the generality of revolving lights in the English Channel, having 21 lamps with reflectors, making 7 lamps on each side of a triangle, which makes the revolutions of the lights as follows: From the first appearance of the light, it is about 6 seconds bright; then succeeds a faint glimmering for 40 seconds, and so on alternately. This light may be seen 12 miles off at sea in clear weather.

2. In running for this port, I should recommend you to get into the latitude of 19° 20′, before you pass the 95th degree of longitude, and from that proceed to the westward, keeping in that latitude: by doing so you will pass 10 miles to the northward of Anegada de Fuera,* and approach Vera Cruz 6 miles to the northward of all the shoals that lie off from it. If in the night-time, a good lookout must be kept for the light, on the larboard bow, and, on making it, stand on to the westward until it bears S. S. W. from you: then, if in the latitude of 19° 20′, you will be 8 miles from the N. N. E. side of the shoals off the harbor. Here bring to, with the ship's head to the northward, observing, during the night, not to approach nearer to the light than 5 or 6 miles, and to keep it bearing from you between S. S. W. and S. The S. S. W. bearing will keep you clear of any shoals that may lie to the eastward of the light, that is, more than 2 miles from it; and the south bearing will keep you clear of the N. W. shore. At day-light, in getting sight of the town, steer for it, observing the following directions:

3. Before you approach nearer than 3 or 4 miles of the town, bring the largest domed-top steeple, in the centre of the town, to bear S. ¾ E. It will then appear with two sharp spire-topped steeples close to it, on the west side, and on the small hill behind the town. There is a division between part of a hill that is covered with grass, and part that is covered with sand. This division will be on with the steeples bearing as above; the grass part to the S. E., and the part covered with sand to the N. W. With this mark proceed on to the southward, along the west side of the Gallega Reef: your soundings here will be regular, from 10 to 5 fathoms; and when you are so far as to bring the S. W. side of the square building that the lookout house stands on in the fort to touch the N. E. side of the light-house, bearing about E. S. E., steer for it, taking care not to open the light-house to the N. E. of the lookout house, until you are close to the castle. This mark will carry you up to the light-house; then steer round it to the southward, and anchor close to the south side of the castle, in from 5½ to 4½ fathoms.

During the months of November, December, January, February, and March, the strong northerly winds prevail, and at times blow very strong, which occasion a considerable sea in the harbor: and, as the ground is not good for holding, I should recommend mooring in these months with the small bower to the N. W., and best to the N. E., in order that you may ride by both anchors, with the wind at north, and lay your stream anchor astern, which will be sufficient to hold you with the land wind, which seldom blows with any force. During other months of the year, moor with your small bower to the N. W., and best to the S. E., in order to have an open hawse to the eastward.

4. There is no regular tide here; but in moderate weather, there is one ebb and one flood in 24 hours, or rather one rise and one fall in that time; for it is the case sometimes that the tide runs to the N. W. for three or four days, and the same to the S. E.; but it appears to be governed chiefly by the winds blowing in the same direction: as the wind blows, its rise and fall is from two to three feet; but in strong breezes, sometimes there is neither rise nor fall for three or four days.

5. The anchorage at Vera Cruz is extremely bad, and if once you part there is no chance of saving your ship, having nothing but broken ground to leeward of you.

The men-of-war of the country always moor with the small bower to the N. W., in 5 fathoms, and the best bower cable to the rings in the Castle of San Juan de Ulua, with a cable over the stern to the S. S. W., in 6 fathoms, by which mode they lie so close under the castle, that they are, in a great measure, sheltered from the violence of the N. and N. W. winds. I anchored in June, 1817, by bringing the S. W. angle of Fort St. Juan to bear N. E. by E. ½ E., about 600 yards off; from which bearing only four guns from the castle or outworks could be brought to bear on the ship. This position may be taken by running in to the southward of the castle, between the shoals of Galle-

* In these directions Captain Mackellar seems to have assumed that circumstances are favorable. In order to guard against the effects of an unexpected north, or a northerly wind, Captain Hester, in some former directions, written in 1764, says explicitly, that none should fall to the southward of 19° 50′, or between that and 19° 40′, until the summit of Orizava is seen, and that care should be taken not to bring that mountain to the westward of W. S. W. The captain of the port, Don Bernardo de Orta, says, as shown hereafter, that the course should be made to windward, on the parallels of 19° 30′, or 19° 40′, and especially so in the months of May, June, and July, when the sun is in the proximity of the zenith. It is at least clear that the safest course is to the northward, particularly to such as cannot rely on their observations.

guilla and Blanquilla, which always show themselves, and round the Gallega Reef, in 5 fathoms, until you bring the bastion of St. Crispin (on the south corner of the castle) to bear N. E. by E. ½ E. Drop your anchor on a quarter-spring, to act according as the wind and circumstances may require.

The town of Vera Cruz furnishes no certain supply of any kind for ships, excepting water, and that bad, and during the winter months difficult to get off, as the sea breaks with so much violence on the pier as to prevent boats from landing for three or four days at a time. As the sea and land breezes throughout the year are regular, there is seldom any difficulty in going in or out of the harbor. During the months of August, September, and October, the rain sets in, with close sultry weather, and the vapors arising from the marshy ground make the season extremely subject to the yellow fever, of which many hundreds die yearly, equal to a tenth part of the whole population, particularly strangers.

Brief Directions for Vera Cruz, communicated to Captain Livingston, by Don Cayetano Olivella, 1819.*

Run in for Ponta Gorda (lat. 19° 14½′) until the Castle of San Juan de Ulua bears S. E. by S., and then keep away to the south-eastward until you bring that castle to bear S. E. You will then steer so as to keep the foremost shroud of the vessel always on with the castle, that is, the foremost shroud of the larboard side, the bearings to be from the wheel or tiller of the vessel. Keeping it so will lead you clear round the reef into the anchorage.

In case of parting one anchor, never attempt to let go another, but make sail immediately, and run the vessel right for the Mole. The current, which runs with great velocity, will not allow you to fetch the Mole; but, steering for it, you will fetch the beach at the S. E. end of the city, by which, at least, the lives of those on board will be saved: whereas, were you to take time to let go another anchor, it would not bring you up, but you would infallibly go on either the Lavandera Shoal, the Isle of Sacrificios, or the reef of rocks off the Punta de Hornos, in either of which cases not a soul could be saved.

You anchor under the Castle of San Juan, and near to it, the centre of the castle walls bearing N. N. E. ¾ E., or thereabout.

Vessels should always keep their fore-topmast staysails, and such others as may be required to run them on the beach, ready bent.

The reefs generally show, either by breaking or by the water's being discolored. You moor with the bower anchors to the N. W. and north, and a stream anchor out astern to the S. W.

Description of, and Directions for, the Port of Vera Cruz, by Don Bertardo de Orta.

1. The Sierras of San Martin, whose highest summit is called the Volcano of San Andres de Tuxtla, bears S. 54° 20′ 35″ E. from the Castle of San Juan de Ulua, distant 25 leagues, and is in the proximity of the coast. The peak of Orizaba and the Cofre de Perote, which is found at a little distance to the west, from its great elevation, may be seen in clear weather a long distance out at sea; and, particularly at night, the light or fire of the Volcano of Tuxtla, are objects which may facilitate making the port by getting good bearings of them, and thereby regulating the succeeding navigation.

2. This premised, whether in running through the soundings of Campeche, or keeping on the outside of them, in the season of the Norths, the course should be directed to Point Delgada; and in the summer, the parallel of Vera Cruz should on no account be run down, (as some directions recommend,) on account of the tempestuous north winds, with which, and even before they come on, there are currents running towards the south, which may, in some cases, carry a ship towards the Inner and Outer Shoals, and more particularly on the Anegada and Anegadilla; for this reason, and because there are such extensive shoals on the edge of these soundings, the land should be made to windward, in 19° 30′, or 19° 40′ of latitude, and that too with the utmost care, in the months of May and July, on account of the proximity of the sun to the zenith, when many persons are not sufficiently expert in the use of their instruments, to attribute their errors to the currents.

3. Having obtained a sight of the land, you will pass to the east of Point Delegada, Bernal, Bernal Chico, Point Zempoala, &c., at the distance of 4 or 5 leagues, and steering from S. by E. to S. S. E. ½ E., you will gain sight of Vera Cruz or the Castle of San Juan de Ulua, without getting into Antigua Bay.

4. We have seen many, who, coming from a lower latitude than 19° 30′, steer for the port without doubt, guided by the outer shoals; and if they were, the unsteady course pursued by some in order to effect it, and the direct course steered by others, towards one or other of these shoals, by which means they have got entangled with a great risk of being lost, has been observed. It is intended, as much as possible, to avoid these wan-

* These directions for entering appear to be particularly adapted to small vessels.

dering courses, by methodising the manner of making the port, and pointing out before the causes that contribute to render the approach to it so uncertain.

5. It is evident they must have proceeded from a point of departure incorrectly calculated, from two, or perhaps from one mark or bearing taken on the coast to windward, a method always erroneous, by mistaking the objects on the charts, and more particularly so, from estimating the distance, (if only one bearing be taken,) usually, greater than it ought to be. The result of this is, that they take their departure from a point and follow a course more to the eastward than they should do, in the confident expectation of discovering the buildings of the city and the castle: this expectation is frequently disappointed, even when they might have seen them, by the culpable negligence, or prejudicial confidence with which they navigate, which is evident from the courses they steer, and the total want of the necessary precautions in approaching it during the night; and by getting into the parallel of the desired point, without obtaining sight of it, they stand on until the breakers of one or other of the shoals, under their bows, undeceive them. The same also happens to those who, by cloudy weather or contrary winds, are prevented from hearing or seeing the signal gun fired from San Juan de Ulua, to warn them of their erroneous course. But, by whatever method they discover their real situation, it will have been, most generally, not until much valuable time is lost, that would have been quite sufficient to have entered the harbor by day, and passed the night in safety.

6. A main cause of establishing an incorrect point of departure, is the greater or less clearness of the atmosphere, at the time of taking the marks on the land; for when the marks appear very clear, as they are high, they are estimated nearer than they really are, and the consequences are those pointed out. If the weather be not clear, or the marks not seen at all, the contrary occurs, and in which there is not so much danger, because the beach, the color of the water, or the depth, if due care be taken, will indicate the measures that must be adopted.

7. The most remarkable objects from which the point of departure is usually established, is the most salient part of the coast, called the Sierra or Maria Andrea, (whence the shore runs to Point Delegada, (which bears from the high platform of San Juan de Ulua N. 29° W.; (Bernal bears from it N. 32° W., Bernal Chico N. 34° W., and Point Zempoala N. 38° W.;)—It appears to be an easy, simple, and safe method of avoiding the errors, dangers, and delays, already pointed out; as so soon as one of these places on the coast is seen and known, and it is determined to proceed for the harbor; after establishing a point of bearing with either of them, such course should be steered as may be deemed eligible for getting into one of the preceding bearings, either the nearest, or that which is most convenient, according to the situation of the ship, and the wind she then has, or that which is to be expected; and, on getting into the situation, steer the opposite course, when, if the vessel be more to the southward than was expected, the buildings of the city and castle, and the masts of the large ships, should there be any in the harbor, will be seen; and if they are not then visible, they will be seen ahead shortly afterwards. In either case you should manœuvre as before directed.

8. Should it so happen that the buildings, masts, or one of the inner shoals be seen in the S. W. or N. W. quarters; or supposing that you may be to the eastward of these bearings mentioned, and also of the Port; and consequently it becomes necessary, according to your position, to steer a course in one of these quarters, either to double these shoals, if you are much to the eastward or southward, or to open the mouth of the harbor if you are not so; with the understanding that the middle of the Inner Anegado, lies N. 77½° E. 4½ miles from the high platform of the Castle of San Juan de Ulua; and the N. W. part of the Gallega, which must be left on the starboard hand, lies N. 4° E. from it. (Between the latter and the inner Anegada, is the Island Blanquilla and Galleguilla.)

9. If at that moment the wind should beat large from the eastward, it will be sufficient to pass within sight of them, and after rounding them, to pass within a prudent distance of the west points of Galleguilla and Gallega, for the purpose of bringing on the bearings that will be hereafter shown, because the same wind, if it is not northward of E. by N., will afterward be scant from Point Soldado inward. If at that moment it should be scant to the northward, or on the starboard tack, it will be necessary to luff, in order to pass to the windward of the Anegada; and if this be easily accomplished, the Galleguilla may also be passed, for the most projecting parts to the north of both these shoals, runs S. 85° 20′ E., and contrary about 3½ miles; the said Island Blanquilla lying somewhat to the south of this line.

10. If this landfall should take place under such circumstances and weather, that the north wind will not admit of standing to the westward to pass to windward of Inner Anegada, nor to the eastward to pass the Outer Anegada, there remains no choice but to bear south or S. W., in order, if possible, to take shelter under Isle Verde, (Green Island,) or that of Los Sacrificios, in 6 to 13 and 15 fathoms water, on good holding ground, riding with two or three anchors down until the easterly breezes set in. But if from anchoring too far off this shelter does not answer your expectation; if a pilot be on board and the

wind continues ahead, so as not to admit you to enter the harbor or to obtain better shelter, it will be advisable to seize the first favorable opportunity of running to anchor under Isle Blanquilla, or Blanca, which is to the northward of Point Anton Lizardo.

11. Some, by their temerity, run into these difficulties when they might have been avoided; for by having obtained sight of the Outer Anegada, they have plied to the westward with a scant wind, in the persuasion of its becoming more large, which does not always happen; and the currents still operated on by the head winds, set with velocity towards the channels between the shoals. The safest way is, when the wind will not permit, according to the situation of the vessel and the time of day, a certainty of passing the Inner Anegada, (which lies with the Outer Anegada bearing S. 69° E., distant 4 leagues,) and of getting into the harbor with daylight, to make a board to the eastward, because the shoals will be left astern, and because the current being favorable, will operate with very good effect.

12. If being more to the westward, and so situated as to be unable to weather round the Galleguilla, in standing to the westward, and the Inner Anegada on the board to the eastward, you ought, without hesitation, to bear up and steer S. W. or S. S. W. in mid-channel, between the latter and Blanquilla, which will be seen on your starboard side; leaving the Anegada and Isle Verde on the larboard, keeping a good lookout to avoid the breakers and steering successively S. W., W. S. W., and W., passing the eastern part of the Gallega Shoal on your starboard, and on the larboard the Lavendera Shoal, the shallowness of which, as well as those preceding it, will be distinctly shown by the breakers on such occasions; hauling up more or less to anchor, in a seamanlike manner, where other ships will be seen riding with two anchors down, and letting go your starboard anchor first.

This is called the S. E. entrance; and Captain D. Fabio Ali Ponzoni, who made a survey of the port in 1807, gives the following account of it: "As all the reefs which surround the exterior of the port may be sounded, and their dangers seen, and the channels which they form, being of considerable depth, not less than the sea within them, it becomes only necessary to be particularly careful of that called la Lavendera, (or Washerwoman,) which is covered with water, and cannot be distinguished except when there is some swell, which breaks on it, particularly with northerly winds. Therefore, in order to enter by the south-east channel, when it becomes necessary to pass near the above shoal, you will always clear it by keeping Point Gorda a little open of the N. E. angle of the fortification, under the Castle of San Juan de Ulua, until an isolated stone building, which serves for a slaughter-house, comes on with the angle of the city, on the wall of which, and at its point, is constructed a building of considerable extent for barracks. Having arrived at this last mark, you will have passed the Lavendera sufficiently to steer for the vessels which are in anchorage, but without going too near the shallow soundings at the southern extremity of the bank, in which the reef of Gallega terminates hereabout.

"The only channel, although deep, which from its narrowness ought not to be passed without a good knowledge of it, is that formed by the reef of Pajaras with that of Sacrificios; the mark for sailing through it, is that before given, of keeping Point Gorda a little open of the N. E. angle of the fortification under the Castle of San Juan de Ulua.

"The narrowness of the deep channel of the Lavendera, and the Hornos Reefs, does not allow of its being adopted, except by small craft with pilots."

13. Under the same circumstances, and being further to the westward, there will be the choice of steering south, to pass between Galleguilla and Blanquilla Island, and successively within sight of the Gallega Bank, rounding it in the manner just mentioned, up to the anchorage. In fine weather, with a ship of moderate size, and a competent knowledge of the place, this passage is more commodious than the N. W. Channel, as it will save the trouble of warping, should the breeze shift to the S. E.

14. A little experience of the Inner Shoals would render these difficulties much less common, as there is as good anchorage under Isle Verde and the Pajaras Reef, as at the Island Sacrificios; and also under shelter of Isle Blanca, or Blanquilla, off Point Anton Lizardo, that point itself, and some of the outer shoals, the channels between which, with a favorable wind and a competent knowledge of them, are quite free; for through them, as well as between all the inner shoals, the harbor may be entered by the S. E. Channel by ships not drawing more than 18½ feet water; for the breeze generally raises a little sea, and the depth in the narrow part, between the Gallega and the Lavendera, is not more than 21 feet.

15. If, in consequence of any irregular navigation or mistake, either of the channels that the outer shoals form with each other, or with Point Anton Lizardo, should have been passed through with a vessel of greater draft than 18½ feet, that is, the ship being between the outer and inner group of shoals; or if, from either of these causes, she should be in that situation, and be under the necessity of entering the harbor by the N. W. Channel, the method pointed out in the eighth paragraph must be resorted to immediately.

16. Having thus described the method of entering the harbor by the S. E. Channel,

and explained the incidents that render that passage necessary, we shall now proceed to describe the principal, or N. W. Channel.

17. All the well grounded fears respecting this harbor may be removed by not approaching it with a fresh north wind, or by mooring or securing your vessel well before it blows with violence. In other respects it presents but little risk for shipping not drawing more than 15 feet water; for the only invisible dangers for ships of greater draft in this channel, are the outer and inner Laxas, which are composed of flat stones. The extensive banks of the Gallega and Galleguilla on the east side of the entrance, and the reef off Point Gorda on the west, form the opening called the Outer Channel, whose extent is scarcely 3 miles; and Point Soldado upon the Gallega on the east, with the reef of Caleta on the west, form the Inner Channel. These reefs are visible, particularly when there is any wind to raise the breakers on them: they may be safely passed at the distance of a cable's length. If there be no sea, and the rising tide has covered the rocks that terminate the visible salient or projecting parts of the Gallega and Galleguilla, a very moderate degree of care will enable any one to distinguish them very readily by the color of the water, as they cannot have more than 3 feet over them in the mornings during the summer, and in the afternoon in the winter, which is the order most generally remarked in the irregular rise of the tides at this place. By night they are certainly dangerous, under the combination of darkness, high water, and so little wind that the sea does not break upon them.

18. If, in consequence of an error in the reckoning, you should be to the westward of the last of the bearings mentioned in the 7th paragraph, or off Antigua Bay, the coast itself, or the low land, will point out the necessity of running along it, S. E., or E. S. E., in search of the harbor, which will be seen ahead; but you ought not to go in less than 8 or 9 fathoms off the Points Brava and Gorda, the reefs of which are shown by the breakers with all winds, and should it happen that at day-break, or in the morning, the land breeze is from S. to S. E., the ship must be kept on the starboard tack as long as possible, in order that she may be to the northward of the harbor when the sea breeze sets in; and there will be no loss of time in running a little to the eastward, with the expectation of the wind inclining more to the N. E., with which the anchorage may be reached on one tack, thereby avoiding the necessity of anchoring outside, and the subsequent labor of warping in.

19. If, from the same cause, the ship should be at day-break, to the N., or N. N. E. of the city, and in sight of it, with the wind off the land, you must not pass to the westward of the meridian of the port, nor of the first bearing of it (mentioned in the 7th paragraph) with the coast, if the latter be in sight and the former not; for should the breeze shift to the S. E., and the land wind not reach, or be inclinable to calm, it might cost some days to get in; for with such winds to the eastward, the current runs with great force to the N. W. However, with any object in sight, it will be easily perceived what method ought to be followed, by attending to its bearings, and by night to the soundings.

20. Being to the eastward of the harbor, and seeing the city and castle, the Inner Anegada, Blanquilla Isle, &c., with the wind from the eastward, which, as mentioned in the 9th paragraph, may be scant from Point Soldado inwards, a course must be steered, more or less free, according to the wind, so as to bring the high tower of the castle to the south, a little to the eastward of which bearing lies the N. W. extremity of the Gallega, and seeing it, as well as distinguishing in the city the two towers of San Francisco and the great church,* proceed inward by keeping away to avoid the Galleguilla and Gallega, until they appear in a line, bearing S., or very nearly so, which is the first leading mark on the plan of the port; but if you are to the westward of that bearing, and close hauled on the larboard tack, it will be sufficient to get on it, and afterwards continue on it, as, on being north of the Galleguilla, it will not be necessary to proceed to the eastward, except in the case mentioned in the 18th paragraph.

21. Being to the westward of these shoals, in 23 or 28 fathoms water, with the two towers in a line, or even with that of the great church open to the S. E., to that of San Francisco, if the wind should be from E. N. E., or E. by N., as mentioned in the 9th paragraph, you will proceed for the entrance by the first mark, diminishing the depth to 6 and 4½ fathoms, good holding ground, until the salient angle of St. Crispin's Bastion, or of the S. E. of the Castle of San Juan de Ulua, comes open with the equally salient angle of the San Pedro, or N. W. Bastion. (the second mark on the plan,) or, what amounts to the same thing, until the whole of the Island of Sacrificios is open to the S. W. of the castle. Then steer for Point Hornos, and successively on, proceeding inward to Point Mocambo, or Island of Sacrificios, in which directions having passed the Caleta Reef

* They are the two westernmost. That of San Francisco is a complete tower, terminating in a square flat roof: the other is not; it has not a third story, nor a terminating point, and is consequently square. The little tower and cupola of the Hermitage of Pastora, which is farther to the west than these two towers, cannot cause any mistake, as it is so small; nor that of St. Augustin, which terminates also in a square flat roof, and lies to the eastward of them.

and Point Soldado, and luffing up or keeping away, as may be necessary to keep the middle of the channel, the harbor may then be entered clear of the Outer Laxa, which is the most dangerous, and also of the inner one, by running close to their buoys, if they are laid down, until the angle of San Pedro's Bastion bears E. N. E. from the entrance of the Round House, or from the binnacle, and then luff up to let go the larboard anchor, which should lie to the N. W., and you ought to occupy a place in the first tier of ships; but should it be necessary to proceed to another, stand further on, and let go the same anchor where the pilot may direct, according to the orders he has received for placing the ship, or to the situation which, according to circumstances, she may occupy. In doing this, every thing should be quite clear for anchoring when you are off the breast-work of the castle, at the moment the order is given; for if, on the contrary, there be any delay, the least inconvenience and risk will be that of weighing the anchor again, and carrying it out, which you cannot always do as you may wish.

CAUTIONS.

22. If the anchor remains in its proper place, and the wind be from E. N. E., or thereabout, proceed with running out a warp of at least two stream cables or hawsers to the S. E., to get the ship up nearly to the berth which she is to occupy; and by passing the warp aft, (which will be attended with no little trouble, as both wind and tide will be against you,) heave her round and carry out springs; at the same time receive on board, on the starboard side, the bend of a cable, which is kept ready; and if you do not get this assistance, you must send a stream cable to be made fast to the ring, and with it haul close in, which will afterwards serve as a guy for the launch to carry the ends of the cables on shore.

23. If, from the scantiness of the wind, the anchor has not been dropped in its proper place, the warp must be of greater length, or another must be prepared, that by heaving it in at the same time as the cable, the anchor may be tripped and let go again in its right place, without impeding the general work.

24. If the winds be from N. E. to N., or in the N. W. quarter, it is advisable, if it be possible, before heaving in the cable, to have on board the hawser, which is made fast to the ring, or to the end or bight of the cable, prepared in it to haul in by. In this case, although the current sets inward, there will be little difficulty in bringing the ship round.

25. The utmost care will be necessary with the N. W. anchor, when anchoring with the wind from E. N. E. to E. S. E., because as you must let it go on bearings nearly opposite to the vessel when moored in her place, if it does not turn when you are warping past by it, the crown will remain towards the ship instead of the ring; and if so, it will not turn itself until she come to hang by it in some north wind, and then perhaps it might not hold. It is therefore indispensably necessary to ascertain this immediately, for it will cost but little trouble to weigh it and drop it again in a proper manner, the neglect of doing which might be attended with great danger; an omission, however, not without examples. It is also necessary to be very careful in placing this N. W. anchor so that its cables should not bear a greater strain than that to the N. E.: the latter can be replaced from the castle or the vessel; but the former cannot, either from one or the other, and, if it fails, a tragical catastrophe may ensue.

26. What has been said in the instructions respecting the winds by this author, is directed to the object of reaching this port, properly prepared with 4 anchors ready, and the best cables bent, and also for lying in it, without placing any confidence in its not being the season of the norths; for, as before noticed, they sometimes come on so suddenly, and blow with such violence out of that season, that at sea they do not afford time to prepare for them properly; and in the harbor they render it in a moment impossible to communicate with the shore by boats, and much more to get any assistance, unless it be given from the curtain of the castle, and which cannot always be reckoned upon with the necessary promptitude, either from being impracticable, on account of the distance, or because an interposed vessel or tier of ships may prevent it; and if the N. W. cable should fail, there is no remedy, as I have before said.

27. For these reasons every mariner, who is acquainted with the exposed situation and narrowness of this harbor, can infer how dangerous it will be, particularly for a man-of-war or other large vessel, during the season of the norths, to anchor at nightfall within sight of the city; or afterwards, in sight of the light in the light-house, and also in the mouth of the Inner Channel, that is, abreast or off Point Soldado, as it happens that when the breeze comes to the S. E., it will not permit of seeking security in the manner directed in paragraphs 22 to 24; and, therefore, whenever they have to anchor off that point, warps must immediately be got ready for warping in the very instant the wind will allow it, without delaying it under any consideration whatever; because, whether there have been any symptoms of norths or not, gales more violent or more sudden have never been experienced, than those which have come on the serenest nights, and with the clearest sky.

28. If, on account of calms, a ship has been brought to anchor within sight of Vera Cruz, or of the light-house, or out of sight of them on the coast of Chacalacas, Juan Angel, &c., in from 50 to 20 fathoms, good holding ground, the topsails should be reefed, and every thing prepared for weighing on the slightest wind or appearance of cloudiness in the north, which ought to warn you; or to slip or cut, if it comes on suddenly, that you may manœuvre or work as may be necessary, in consequence of its force, the time, the situation, and the size of the ship, or other circumstances; whether, by standing to the eastward and carrying all the sail possible, which is the most certain method of clearing the Outer Anegada, where there is the greatest danger, or by standing off and on until day-light, and then to run for the harbor, or to run for it with sail proportioned to the distance and the time. But of these two last determinations, the first ought only to be taken in case of being entangled and unable to clear the Inner Anegada; and the second from urgent necessity, in consequence of shortness of provisions, damages, &c., or from having a small vessel, with good anchors and cables, and sufficient experience to work with correctness; or in case of the wind's decreasing, when it might be practicable to run in towards the coast. You ought always to keep in mind the risk there is, particularly with a large ship, in going into the harbor in the strength of the gale, for it blows more violently within than it does without; and casualties may defeat the most ably concerted measures for anchoring, under circumstances so critical as those produced by the combination of a violent wind, heavy sea, narrowness of the anchorage, the numbers of anchors scattered over it, the vessels in it, and the want of assistance. On such occasions the necessary operations are not a little embarrassed by the melancholy effects produced by ships driven from their anchors, and others obliged to cut, driven ashore on the Hornos Reef, or the Lavandera Shoal, to the imminent peril of many lives.

29. Some expose themselves to these difficulties when they might be avoided: for on getting within sight of Vera Cruz, at the close of day, they stand on towards the harbor with an expectation of the continuance of the breeze, but this does not always happen; for although it might favor them a little, yet, in general, it gives way to the land wind, (from west to south when it announces fine weather, and if from north to west it indicates the contrary,) or to a calm; consequently frustrating the attempt in the first case, and in the latter they are compelled to remain outside and exposed.

30. Knowing this, and that when the land breeze comes, there is no dependence upon its continuation, or that it will be suitable for clearing the Galleguilla and Gallega, and to open the mouth of the harbor, it will be necessary at sunset (when the manœuvre made can be seen from the signal tower, or even before) to determine the succeeding operations, according as the season of the year, appearance of the weather, the distance from Vera Cruz, or the shoals, and the number of ships in the harbor, may render them advisable; and should there exist the smallest doubt of being able to get in before dark, if in the time of the norths, it will be expedient to haul to the wind on the starboard tack, and stand off for 7 or 8 leagues to the N. N. W., N. N. E., or N. E. of it. Such a position will be a good one in case of a north wind coming on during the night; and if not, for working at day-break, so as to get early in sight of the castle, city, &c.; but if you have not a large ship, and if it be not in the season of the norths, this precaution will admit of some modifications.

31. From the preceding remarks it will be inferred, that entering the harbor by night is by no means to be approved of, especially with ships of the line, or of ships of nearly the same draft. It has, however, been successfully done, and doubtless will be accomplished again; but the author of these instructions once entered it with a combination of all desirable circumstances, and yet very narrowly escaped the most disastrous consequences.

32. Notwithstanding what has been said in the instructions relative to the winds, if in the good season there can be any confidence in them, it may be expected in the months of May, June, July, and perhaps August, during which, in approaching the harbor, and nearing the Inner Channel, if with a large ship, the following instructions must be observed, if the wind will permit; but if not, according to the greater or less distance you may be from the harbor, when it becomes adverse, or falls calm, either come to an anchor or not, in the confidence that every practicable assistance will be given you, and that you will have a pilot off with the least possible delay, by two guns in quick succession, as an indication both of your intention to anchor and being in want of a pilot, which will be answered from the castle by two guns being fired in slow succession, both to indicate your signal hath been understood, and to give an opportunity, by the flash of the second gun, of taking the bearing, if not previously ascertained.

33. Night then coming on, when you are in sight of Vera Cruz and of the light-house, on the east side of the harbor, and of one, two, or three miles to the northward of the Inner Anegada, Blanquilla Island, or the Galleguilla, steer to the W. N. W. to open the mouth of the harbor, until the light-house bears S. S. W., and then to the W., until it bears south; and afterwards S. W. until it bears S. by E., when you should steer south, which will be on, or nearly so, with the first leading mark of the plan and in the Outer

Channel, diminishing the depth to barely 4¾ fathoms, until the light bears S. E. ½ E., in which situation, (where it is usual to take a pilot,) if it be a ship of the line, or one of great draft of water, and you have determined not to enter, let go an anchor to wait for day-light. But if the ship be of a medium draft, and without a pilot to direct the entrance, which it is desirable to effect, you must steer S. E. by S., for the purpose of passing the Outer Laxa, until the light bears E. by S., when you must stand in E. S. E., passing close to the N. W. buoys, and proceed afterwards as directed in paragraphs 21 to 24, or seamanlike, as different circumstances, not therein specified, may occur.

34. Should night come on when you are on the meridian of the harbor, or to the N. N. W. of the light-house, steer so as to bring it to bear S. by E., and from thence steer south, being on, or nearly on, with the first leading mark in the plan, and then proceed according to the foregoing paragraph.

Finally, should night come on when you are N. W. by N. from the light, which will be near to the shore, you must steer E., or E. by S., to pass clear of the Points Brava and Gorda, and so soon as the latter is passed, steer S. E. by S., or towards the light itself, or until you find from 6 to 5 fathoms, and then S. S. E. until the light bears E. by S., after which E. S. E. into the harbor; but if you have a ship drawing less than 15 feet water, so soon as Point Gorda is passed, you may continue on the S. E. by S. course without danger of Point Soldado, the Caleta, or from the Outer Laxa, which may sometimes be passed over.

TABLE

Of the distances of the Peak of Orizava, in the province of Vera Cruz, according to the apparent angles of elevation; supposing its real height above the level of the sea to be 2795 toises, or 5970.4 English yards, and the terrestrial refraction one-sixteenth of the intercepted arc, by Don Josef Joaquim Ferrer.*

Distance from the Peak in miles.	Apparent Angles of elevation.	Difference for 3 and 6 miles.
63	2° 12′ 58″	8′ 37″
66	2 4 21	7 58
69	1 56 23	7 25
72	1 48 28	6 56
75	1 42 02	6 30
78	1 35 32	6 07
81	1 29 25	5 45
84	1 23 40	5 28
87	1 18 12	5 11
90	1 13 1	4 57
93	1 8 4	4 43
96	1 3 21	4 30
99	0 58 51	4 20
102	0 54 31	4 08
105	0 50 23	3 59
108	0 46 24	3 51
111	0 42 33	3 42
114	0 38 51	3 35
117	0 35 16	3 28
120	0 31 48	6 39
126	0 25 9	6 15
132	0 18 54	5 57
138	0 12 57	5 41
144	0 7 16	5 24
150	0 1 52	

Use of the Table.

The first column indicates maritime miles; the second the apparent angular altitudes of the Peak of Orizava, corresponding to the miles stated; the third indicates the variation of the angular altitude in 3 miles of distance to 31′ 48″, and in 6 miles to 1′ 52″.

EXAMPLE.

Suppose that the altitude of the Peak above the horizon of the sea, was observed to be 0° 59′ 0″, and that the depression or dip, was 10′ 20″; what is the distance between the vessel and the Peak of Orizava?—Horizontal angle observed corrected for the error of the instrument observed with ..... 0° 59′ 00″
Dip of the horizon, ... 10 20

Apparent altitude of the Peak, 48 40

On consulting the table, it will be seen that this angle is comprehended between 105 and 108 miles distance, and without any other operation, it is at once seen that it is nearly 106 miles; but if it is desired to determine it with greater accuracy, note the difference for 3 miles in the angular altitudes between the two distances that are nearest, which is 3′ 59″, and the difference between the angle observed and that corresponding in 105 miles of distance is 1′ 43; therefore the true distance will be $= 105 + \frac{3' \times 1' 43''}{3' 59''} = 106' - 18''$, or 105′ 42″.

FROM VERA CRUZ TO THE RIVER TAMPICO.—From the harbor of Vera Cruz the coast trends about N. 53° W., a distance of 11 miles, to the River Antigua, where, with some sinuosities, it extends N. 20° W. 6 miles farther to the Point and River Chacalacas, thus forming a bay named that of Antigua. From Chacalacas it continues in the same direction N. 20° W. 6 long miles farther, to the Point of Zempoala, forming also between the two a bight extending to the westward, and in which, at the distance of 3 miles, the River Juan Angel disembogues. From Zempoala the coast trends to the westward, and forms a regular bay with Point Bernal, which lies about 10 miles N. 21° W. from Zempoala Point. This Point Bernal bears from Vera Cruz N. 29° 28′ W.

* Although the foregoing directions by Don Bernardo de Orta are somewhat verbose, we prefer giving them in full to curtailing them.

On the south side of Point Bernal, and at the distance of about a mile, there is an islet called Bernal Chico, which bears from Vera Cruz N. 31° 52′ W., and which, as well as all the coast of the bay, is very clear; there is room to pass between it and the point in 5 and 5½ fathoms water without risk. To the south of it there is shelter against winds from the N. W. quarter as far as north, but none from winds to the eastward of north. To anchor in this bay there is no need for any other guide than the lead, there being, at half a mile from the beach, 4½ fathoms water. Off the coast, between Zempoala and Bernal, there is a shoal which is visible, and which lies north a little easterly from Zempoala Point, at the distance of 4 miles, and at a similar distance from the coast abreast of it. It is necessary to be cautious of it, especially in the night time; and with large ships it should always be passed on the outside, for in the channel between it and the shore, there is a ridge of rocks running off the land on which there are not 4 fathoms water.

From Point Bernal the coast runs north, a distance of 4 miles, to that of Maria Andrea, which bears from Vera Cruz N. 26 32½′ W. From Point Maria Andrea the distance is 9 miles N. 18° W. to Point Delgada, whence the coast trends N. 33° W., 10 miles to Point Piedras, from which the direction of the coast continues N. 33° W. a distance of 70 miles to the River Tuspam; from this river the distance is 15 miles N. 15° W. to the bar of Tanguijo, and thence it is 23 miles N. 10° W. to Cape Roxo, which by good observations is in latitude 21° 35′ N., and 1° 14′ 45″ west longitude from Vera Cruz.

Between Cape Roxo and the River Tuspam there are various shoals and islets lying at a distance from the coast, which form good breakwaters and excellent anchorages, sheltered from the norths. The first and the southernmost is the shoal of Tuspam, lying about 11 miles N. 60° E. from the river of that name; on this shoal there are some very small islets, and on the S. W. part of it there is good anchorage in from 7 to 9 fathoms water, on coarse sand, at about 2 cables' length from its edge. About N. W. from this shoal, and at the distance of 12 miles, is the Bajo de Eumedio, or Middle Shoal, which is distant from the coast and east of the River Tanguijo 8 miles; this shoal is much smaller than the preceding, but it affords good anchorage on the S. W. part, in 5½, 7, or 9 fathoms, on sand. North somewhat to the east of this shoal, and at the distance of 3½ miles, is that named Tanguijo Shoal, which, on its S. W. part, presents better anchorage than either of those just mentioned. The channels formed between these two shoals are very clear, with a good depth, and between them and the coast there are no dangers but what are visible.

Off Cape Roxo are the Islands Blanquilla and Lobos; the first, which is a bank with several small islets on it, lies E. S. E. of the cape, distant about 5 miles: south a little easterly from it, and at the distance of 6 miles, is the Island Loboz, in lat. 21° 26′ N., and long. 1° 8′ 45″ W. of Vera Cruz. From the north side of this island a great rocky shoal extends, which leaves a strait of only 3 miles wide between it and Blanquilla; and in the middle of this strait there is a shoal; so that the utmost caution is required in passing through it. To the S. W. of these islands there is an excellent anchorage, well sheltered from the norths, and which requires no particular instructions for reaching it.

All the coast which we have described from Vera Cruz to Cape Roxo is clear and deep, and without any other dangers than the rocky ridges which stretch off from Juan Angel, in the Bay of Bernal and at Point Gorda; and throughout the whole of it there is a bank of soundings extending from the shore 8 or 10 leagues, and is so deep that at one or two miles from the beach there are from 4½ to 6 fathoms. The land is not very high, and terminates almost at every part in a sandy beach, is covered with brushwood and small trees, which are very thick, and show their verdure at a moderate distance; and although there are no prominent marks to distinguish the land by, the latitude will be sufficient to point out what part of the coast the ship may be on. Nevertheless, it may serve in some cases to know that Mount St. Juan and the Island Blanquilla bear S. 65° W., and N. 65° E. from each other.

From Cape Roxo the coast rounds or trends to N. 19° W., a distance of 7 miles, and forms the front of the cape; and thence to the mouth of Tampico River, the bearing and distance are N. 34° W. 43 miles. The River Tampico is considerable, and has a sufficient depth of water for ships that draw less than 12 feet; the bar lies N. W. and S.E., on which there is more or less water, according to the currents of the river: it is situated by good observations in latitude 22° 15′ 30″ N., and longitude 1° 42′ 33″ W. from Vera Cruz. Although in this line of coast there are no marks which can be distinguished but by pilots, nevertheless, a *height* which is to the southward of the mouth of the river may serve as a guide; (it is the highest land between Cape Roxo and the bar, where the heights of Macate, Chapapote, and Martiner commence;) and also the opening of the land formed by the river's mouth, which is easily distinguished at the same time as the surf on the bar. You may anchor, as before said, in any depth you please, as the ground is good for holding; the only inconvenience being the sea raised by the wind, and the heavy sea during the calm nights.

About 5 miles within the bar, upwards, there is a little channel on the southern bank, which leads to the lagoon of Tampico, or Old Town, with three islets in it; and at the entrance the Old Town, or that of Tampico, bears about S. S. W. from the bar, distant scarcely 5 miles. To the N. W. of that channel, there is another which leads to the turn of Altamia; and 10 leagues, in a straight line from that of Tampico, up the river, is that of Panneo: at all three towns provisions of every sort may be obtained. On the coast, comprised between Tanguijo and the River Tampico, in which Cape Roxo is situated, there is nothing more than a narrow tongue of land, which separates the lagoon of Tamiagau from the sea.

Directions for Tampico Anchorage and Bar, by Capt. John Mackellar of H. B. M. Ship Pique, 1818.

Tampico Bar is situated in lat. 22° 15′ 56″ N. and long. 97° 50′ 18″ W., the variation of the compass 8° 25′ E. As the land is low all round this place, and having nearly the same appearance, it is rather difficult for a stranger to find out the entrance of the river; on that account I would reccommend proceeding in the following manner:—

Ships coming from the eastward, and having got soundings in 60 fathoms, ought immediately to get into the lat. of 22° 16′ or 22° 18′, and from that make a west course.—If the latitude can be ascertained, this is the most certain method of making a good landfall; but in the event of your not being able to get your latitude, and making your land to the northward or southward of the river, it may be known thus: in the latitude of 22° there is a range of small hills not higher than large houses; this land is S. by E. by compass about 5 or 6 leagues from the bar. In latitude 22° 9′, and apparently 4 miles in shore, on the fall of a cliff, stands the Town of Tampico, which may be seen from the sea, and is the only town on this part of the coast: in the south end of it there are two long white houses, like barracks; the rest appears to be scattered houses off to the N. N. W.—From this town to the anchorage off the bar, it is north 6 or 8 miles. The entrance to the river cannot be made out more than 4 or 5 miles off, as there is nothing more than three or four small boats on the south side of the entrance. To the north of the river, in lat. 22° 23′, and 3 or 4 miles in shore, there is a small flat hill; this appears, when you are 6 or 7 miles off, in the shape of a flat boat, bottom upwards; between this and the entrance of the river, the white sand covers the tops of the small hillocks along the shore, having the appearance of small sand hills, rather than of a sandy beach. These are the only objects that can be pointed out to be of any assistance to a stranger in making the land.

Having made the river out, and intending to anchor, bring the entrance of it to bear S. W. or S. W. by W., and run in on that bearing until you are in 8 or 7 fathoms, and then anchor; your distance from the shore will be about 3 miles. The bottom is very good and clear, being fine soft mud, and holds well to the northward of the river, with plenty of room to get under way, should it come on to blow; but this anchorage is not in the least sheltered from either wind or sea; and during the winter months, that is, from November to the middle of April, when the northerly gales prevail, no vessel is safe here that cannot go into the river; for these gales blow with such violence that it is impossible for any ship to remain at her anchors; and in the event of the wind's coming to the eastward of north, you cannot carry sail to clear the land. Therefore particular attention ought to be paid to the appearance of the weather; and as soon as there is the least sign of its blowing, get under way and make sail to the N. E. until you are off soundings; then bring to for a change of weather. These gales, in general, blow from N. W. by N. to N. by W., and I have never seen them to the eastward of north.

The entrance of the river is, I think, the most dangerous I have ever seen. The general depth of water on the bar, is from 8 to 14 feet; and the strong run of the river coming out and meeting the surf, makes one continual sheet of broken water, the bar being composed of quicksand, which shifts with every gale of wind; and even in a fine day and smooth water, and at the anchorage, the bar has a very alarming appearance to a stranger. It is attended with much greater danger on coming out in a boat than in going in, and coming out with the wind blowing in, ought to be well considered before you attempt it; for should you be prevented from pulling out by the heavy sea and wind, you will find great difficulty in getting back against the stream of the river; and winding your boat is attended with greater danger than all the rest. Within the river there are from 3 to 5 fathoms of water, and it is about three-quarters of a mile broad. It is navigable about 30 leagues from its entrance. About 5½ miles up, is the old village of Tampico: it stands on the south side of the river, or rather on the south side of a lake. Boats can only go within half a mile of it.

BERMUDAS OR SOMER'S ISLANDS.

General Instructions for making the Bermuda Islands.

	Latitude.	Longitude.
Saint George's Town, at the eastern end	32° 22′ N.	64° 33′ W.
Wreck Hill, at the western end	32 18½	64 50
S. W. Breakers	32 10	64 45
	Variation 3° W.	

High water, full and change, at St. George's, one-quarter past 8. Common tides rise about 4 feet: but on the springs, or in gales of wind, frequently to 6 and 7 feet. The floods in the offing set to the N. E. and the ebb to the S. W., but near the shore they run in various directions. These islands being surrounded with innumerable shoals, much precaution is necessary in approaching them. The principal dangers lie to the westward and northward, and extend from the land between 3 and 5 leagues, in a due west line, from their south-western point (round northerly) to a N. N. E. one, from David's Head, their eastern extreme. The remainder of the coast, forming their southern and eastern boundary, may be approached in every part within a mile, and in several places to less than half that distance.

On account of the prevalence of westerly winds in the Atlantic, it has become the general practice for all vessels bound to the Bermudas, to make the land from the westward, by getting into their latitude about the 68th degree of longitude, and then steering an east course till they become visible.

When running down a parallel for Bermudas, with a large wind, and not making the land towards night, but expecting to be near it, no vessel in this situation ought to lie to, but should rather turn to windward under an easy sail until day-light, because of a probable current which is variable, and it is known that vessels have been carried by it out of their reckoning to the distance of many leagues, and brought them unexpectedly among the rocks. The land not being high, (for Gib's Hill, the highest land in the islands, is but little more than 180 feet above the level of the sea) it cannot be seen at any great distance from a small vessel. Add to this the thick haze that frequently prevails here, particularly in fine weather, renders making the land somewhat difficult, and at times precarious, unless the latitude be accurately ascertained, for instances have happened of vessels missing the islands: and, after a fruitless search, steered for the American coast, in order to take a fresh departure for running down the latitude again.

The rocks and islands of Bermudas lie N. E. by E. and S. W. by W. about 9 leagues, and in breadth about 5. Wreck Hill forms the west point, and St. David's Head the east. Round the west, N. W. and north sides, it is a continued and very dangerous ledge of rocks, beginning at the Long Bar, the south part of which lies 6 miles W. S. W. from Gib's Hill; tending then N. E. it is called the Chub-Heads, which, off Wreck Hill, lies 9 miles from the shore. The ledge hence rounds to E. N. E., and joins the North Rock, which is always above water, and lies N. N. W., 12 miles from Catharine Point. From the North Rock the reef rounds E. and E. S. E., and ends in Mill's Breaker, which dries at low water, and lies at N. E. 6 miles from Catharine Point, and N. N. E. from St. David's Head. The outer edge of the ledge is close and compact, leaving no passage through it for ships, excepting a small one near Wreck Hill, another by the North Rock, and one round Catharine Point. Round the outer edge of this ledge is a margin of soundings, of from one to two miles broad, having from 9 to 14 fathoms on it. There are, likewise, soundings for two miles from the shore round the N. E., east and S. E. sides of the island; but, as the water here is deeper, it would be prudent for those who suspect themselves near the longitude of Bermudas in the night, or in thick weather, while between the latitudes of 32° and 32° 40′, to keep a lead constantly going; being assured that at 14 fathoms they will strike the ground in time to avoid danger. The lead might be incased with tallow, for the greater certainty of striking ground. This precaution, I am persuaded, would prevent many of the wrecks that constantly happen here.

There is a rocky bank lying from S. S. W. to S. W. from Gib's Hill, (or S. W. part of Bermudas) from 3 to 5 leagues distant. Various depths, from 17 to 45 fathoms, are on it, and other large ships have grounded.

The latitude of 32° 8′ N., being two miles to the southward of every danger, seems best adapted in fine weather for this purpose, and will bring you in sight of Wreck Hill, which being of a conic form, and having a volcanic appearance, is the more remarkable. The moment this hill becomes shut in with the other lands, or is no longer distinguishable, you will pass the only danger to be apprehended off the southern part of

these islands, called the S. W. Breakers, (which do not, however, lie more than 1½ mile from the land,) and may then immediately close in with and steer along the south-eastern shore, within a mile, till you have got the length of Castle Harbor, or brought David's Head to bear about N. by E., where you must wait to receive your pilot, taking care, during that time, not to be drifted to leeward, as the currents generally set to the eastward.

Should you meet with a contrary wind, or the weather be extremely hazy, before you have got sight of land, it will be prudent in the night not to stand to the northward of 32° 4′ or 5′; and if the wind should be inclining to the southward, I would recommend not beyond 32°.

If bound to Bermudas from England or from any part of Europe, I should recommend a direct course to be steered as long as the winds permit; but the moment they become contrary, to get to the southward into the trades, and then run down the remaining longitude, taking care to haul to the northward in sufficient time to reach the latitude of 32° 8′, about the 68° of longitude, and then proceed as above described; but should fair winds continue the whole passage, the land may be made with equal safety from the eastward, by steering for them in the latitude of 32° 18′ N., which is two miles to the southward of David's Head, their south-eastern extreme, and off which head there is no danger beyond half a mile, care being taken not to come to the northward of that latitude until you have brought the head to bear W. S. W., on which bearing it may be approached with safety till within one mile thereof, or till you receive your pilot.

In the course of making the land from the eastward, should the wind become contrary, or the weather prove dark, hazy, and tempestuous, come not during the night to the northward of 32° or 32° 6′, in which latitude, if you should be found to have run past the islands, you must proceed as before described, in making them from the westward,

Ships bound from the southern ports of America, within the Gulf Stream, should steer well to the southward, perhaps as much as S. S. E., until they get within 3 or 4 miles of the latitude of Cape Hatteras, and then steer S. E. by E. until they get into the latitude of 32° 5′. Thus you will avoid crossing the Gulf Stream where it is very broad, and its direction far to the eastward, and pass it where it affects your latitude more than your longitude; and, of course, be of less consequence to the ship's reckoning; and, by steering thence so far to the southward as S. E. by E. you will fall into the latitude of Bermudas, at 4 or 5 leagues of longitude to the westward.

You should by no means run for these islands unless sure of your latitude; and always make them from the S. W. if possible, looking out in time for the land, as, owing to the set of the Gulf Stream, and the general tendency of the currents to the eastward, ships from the coast of America will almost always be far ahead of their reckoning.

Having ascertained your latitude, and being well to the westward, get into the parallel of 32° 5′; then steer due east. This course will bring you to the island, passing about 4 miles clear of the south end of Chub-Head, a very dangerous shoal, lying across the west end, about 8 miles from the land, with not more than 12 feet on it at low water, as well as the S. W. Breakers, which lie about one mile and a half S. S. W. from the southernmost land, being the shoalest part of a ledge of rocks of considerable length, lying parallel with the shore. Should the wind in the night incline to the northward, keep in 32° 7′ N., if to the southward, in 32° 2′.

You must avoid, by all means, running in the night, without having a good observation the preceding day, and being pretty sure of your longitude. Follow these directions, and you will first make Wreck Hill, (which is high land on the western extreme of the islands) and the land trenching from it to the S. E. Having passed the S. W. Breakers the land lies about E. N. E. and W. S. W., having danger no more than half a mile off, and that generally visible; you may run safely along shore at a mile, until you pass Castle Harbor, which is easily known by the castle on an island on the starboard hand. You should bring to off the eastern part of this harbor, and wait for a pilot, who will soon come off, and carry you into St. George's Harbor. But, should you be pressed for time, or the pilot not come off, you may haul round by the breakers, after having passed the islands, which form the south part of Castle Harbor, into St. George's Road, bringing on the following marks:

A high island, next to the N. E. part of the small ones off Castle Harbor, has, at its eastern extreme, a bluff rocky point, called St. David's Head, having breakers off it about half a mile. The northernmost land in sight, after you haul round St. David's Head, is called St. Catharine's Point; bring this point to bear W. N. W., and St. David's Head S. ½ W., and you will be in as good a berth as any in the road, with 7 or 8 fathoms water; but, in every part of these roads, you must be guided by the eye where to drop your anchor, clear of foul ground, which is every where easily seen, owing to the clearness of the water, and the whiteness of the sand, where the anchorage is safe.

In case you have been driven to the eastward of the islands, (a situation, however, which you are to avoid with the utmost care,) you may run for them in latitude 32° 14′ N., which will bring you to them 5 or 6 miles to the southward of St. David's Head, for

which you may haul up upon making the land; but you are not to run in till you are far enough to the S. W. to follow the directions before given for coming from the westward, should you make sail for Bermudas from any part of the Gulf Stream, or without it.

Great allowance is recommended for being to the eastward of your reckoning, and try to fall into the parallel of latitude above mentioned, in longitude 70° or 71° W.

As the soundings do not extend more than a mile and a half from the land, on the southern side of the islands, a correct latitude, and a good lookout, together with a strict attention to these instructions, is absolutely necessary.

Other directions in coming from the westward.—On coming from the westward, the S. W. points of the land ought to bear E. N. E. before you come within 4 leagues of the land, when you may steer directly for it without danger. The breakers on the south side always show themselves, so that a ship may safely approach within gun-shot from the S. W. end to the S. E., and, when getting to the eastward of the castle, round into St. George's. Do not go farther to the northward than to keep Cooper's Island open within St. David's Head till you get a pilot, and the subscriber engages no ship will ever strike if this be attended to.

THOMAS LEAN.

WEST INDIES.

From the Hole-in-the-wall to the west end of Hog Island, or the entrance of the harbor of New Providence, the bearing is S., and the distance 15 leagues. But allowance in sailing must be made for the current, which generally sets, with considerable strength, between Abaco and the Berry Islands. At Great Egg Island, and in its vicinties, the currents are very uncertain, and there much caution is necessary.

Vessels from the eastward, in general, had best make the coast of Eleuthera, in a track between the parallels of 25° 20′ and 25° 30′, not exceeding the latter, or the parallel of Harbor Island.

On leaving the Bird Rock, when bound for New Providence, it is best to make Watland's Island, proceeding along the west side of that island, or between it and Rum Key, for a good departure. You must be careful not to approach the little Island called Conception Island, because a long and dangerous reef extends in a N. N. E. direction from that island above 7 miles.

Harbor Island lies in latitude 25° 31′, but a reef extends about 3 miles from its north shore, to which a berth must be given, there being several rocks near to the outer edge, nearly even with the surface of the water. The water is, however, perfectly clear, and they may be seen from the foreyard or bowsprit end, in time to be easily avoided. The bank extends W. and W. by N. to Egg Island, a distance of 7½ leagues, and a reef extends from that island nearly 4 miles in a N. N. W. direction. Having advanced to the northward of the Cow and Bull, off Harbor Island, the course to Egg Island, the westernmost isle of the range, is W. by N., and the distance, to clear the reef, 8 leagues. On running along shore, you will pass some rocks, called the Perno Rocks; but the islands are too closely connected to be particularly distinguished.

Egg Island is a small island, covered with brush-wood, with a rise of land in the middle of it. Being off this island, keep well out to avoid the reef, the pitch of which lies with the centre of the island S. S. E. ½ E. On rounding the reef, you will open a small rocky island, situated to the south of Egg Island, called Little Egg Island. The course, by compass, hence to the light-house, or Nassau Bar, will be S. W. by S., 10 leagues, and to the Douglas Passage, eastward of the harbor, S. by W., 8 leagues.

The keys between Egg Island and Providence, upon the edge of the bank, form a bay, as represented on the chart, and the reef is steep to. Of course, vessels passing in the winter, or during the prevalence of northerly winds, must cautiously avoid being embayed there, as the only shelter is an inlet between the eastern end of Rose Island and the Booby Rocks, where there is a depth throughout of 27 feet. But in summer, as northerly winds then seldom prevail, and the trade wind, generally, the shore may be kept well on board; and especially, because the current may sweep you past the harbor of Nassau, which could not be regained without difficulty.

The town is on the north side of the island, sheltered on the north by Hog Island, and stands at the westward of the harbor. It may be distinguished at a distance by means of the Government House, which is a large white house upon the top of a hill, seen over Hog Island. Bring this to bear S. S. W., or S. S. W. ½ W. By keeping it so until within 2 or 3 miles of Hog Island, or perhaps sooner, a pilot may be obtained.

The entrance into the harbor is at the western end of Hog Island, which is distinguished by the light-house. It has 18 feet of water, with sandy ground. The latter is not good for holding. In the middle of the harbor there is a bank of 3 or 4 feet water; but there is a channel on each side of considerable extent.

NASSAU BAR.—Vessels approaching Nassau in tempestuous weather, when the pilot cannot cross the bar, by observing the following directions, may come safe over, when the pilot will be ready to receive and conduct them to their anchorage.

On a white flag being hoisted on the point of Hog Island near the light-house, a small white flag flying, will be in readiness within the bar, the vessel will then steer in, giving the point of Hog Island about 80 fathoms distance, and keeping Toney's Rock (a small rock within the bar, on which a beacon is erected) and the west end of Fort Charlotte barracks in one; keep this course until you bring the white flag on the point to bear east; then put your helm to the starboard, and keep for the boat. It sometimes happens that the sea breaks from point to point, even in moderate weather. When this is the case, and the wind should be to the south or east, it would not be prudent for vessels of a large draught of water to enter, as there are not more than 17 feet water at low tide on the bar. By order of the Commissioners of Pilotage.

The Douglas Passage and New Anchorage are situated on the east and south sides of Rose Island, to the eastward of Nassau Harbor. The entrance is denoted by beacons fixed on two rocks, called Douglas' Rocks, which form the entrance, and a black buoy, which is placed at the end of a reef stretching from those rocks, and situate at N. by E. $\frac{1}{3}$ E. 179 fathoms from the high or upper beacon. These beacons can be seen from the deck of a frigate, when steering in a line between Egg Island and Nassau.

The black buoy above mentioned is placed in 9 feet water; but at a boat's length from it, there is a depth of 4 fathoms. Opposite to it is the end of a reef which extends from Booby Island, leaving a passage of 160 fathoms in breadth, which has a depth of 4 fathoms at very low tides.

To steer for this anchorage, bring the beacons in a line, bearing nearly S. E. by E., and steer directly for them, until you bring Booby Island end on; then haul up for the buoy, passing it on the starboard side and to the eastward, at the distance of about 30 fathoms. When past the buoy every danger may be seen, and you may haul round to the westward, and anchor in $4\frac{1}{2}$ fathoms, good holding ground, with the beacons in one, bearing N. W. by W., distant about 2 miles, where you will be well sheltered from N. W. winds.

A frigate, drawing 18 or 20 feet of water, may proceed to the S. E. side of Rose Island, and anchor in a quarter less five, at about 6 miles from the town of Nassau, well sheltered from N. W. winds, and from the S. E. by the bank.

The direct bearing from the Hole-in-the-wall to Providence Bar, or light-house, is S. $\frac{3}{4}$ W., 15 leagues. The bearing and distance from the Hole-in-the-wall to the pitch of Egg Island Reef, are S. E. $\frac{3}{4}$ S. 20 miles.

Those bound to New Providence, who are unacquainted with the Douglas Passage and the New Anchorage, should not attempt to pass the Hole-in-the-wall with a N. W. wind, when blowing strong, there being no safe anchorage hereabout.

In the event of making the Hole-in-the-rock or Egg Island in the afternoon, with a strong wind from the N. E., you should haul close round Egg Island Reef, and steer S. by W. 8 leagues, for the Douglas beacons; and having made the beacons, bring them in one, bearing nearly S. E. by E., and steer for them. Keep your lead going, and you will have gradual soundings. When in 9 fathoms you may anchor with the marks in one, fine sandy bottom, well sheltered from northerly winds by the rocks, &c.

At Nassau, New Providence, and in the entrance of the New Anchorage, and in its channels, the tide runs at the rate of $4\frac{1}{2}$ miles, and rise 4 feet at the springs, and the currents have much force.

ELEUTHERA is one of the largest islands, and is of very irregular shape. Its west end bears N. E. $\frac{3}{4}$ N., distant about 10 leagues from the east end of New Providence; it thence extends eastward about 9 leagues, then S. E. about 4 leagues to Palmetto Point; and, lastly, about S. $\frac{1}{2}$ E., 12 leagues, to its south end, denominated Powell's Point, being of irregular breadth, from 2 to 4 miles. The E. and N. E. shores are washed by the Atlantic Ocean, while on the west is the shallow and smooth water of the bank. On the west side are the settlements of the Rock Sound.

GUANAHANI, OR CAT ISLAND.—The N. W. end of this island lies about $8\frac{1}{2}$ leagues E. $\frac{1}{2}$ S. from Powell's Point, in Eleuthera; it thence extends south-eastward 15 leagues, having a breadth of 3 to 7 miles. Its eastern side is lined by a reef, on which the sea continually breaks, and renders it inaccessible: on the S. W. side is good anchorage. This island was the first land seen by Columbus, who landed here on the 12th of October, 1492. By him it was called St. Salvador, but it is now commonly called Cat Island. Between its N. W. end and Powell's Point, at the distance of $4\frac{1}{2}$ leagues, S. E. from the latter, is the N. W. end of Little Cat Island, joined to Cat Island by a bank which surrounds both of them.

Between the south end of Eleuthera and Little Cat Island, is a channel 3 leagues wide, called Ship Channel.

YUMA, OR LONG ISLAND, so called from being peculiarly narrow in proportion to its length, is nearly 17 leagues in length from S. E. to N. W. The north-west end

lies 8½ leagues south from Cat Island, and its south-east end bears from the Bird Rock at the west end of Crooked Island, W. by N., 8 leagues. There is an anchorage on its east side, called Great Harbor, whence it exports salt.

EXUMA, &c.—The islands called Great and Little Exuma, lie to the westward of Long Island, and to the southward of Cat Island. Their chief produce is salt, and the Great Isle has a port of entry.

North-westward of Exuma, to the distance of 22 leagues, on the eastern edge of the Great Bank, are a number of Little Islands, distinguished by the name of Exuma Keys; to these succeed several others in a more northerly direction, to the distance of 8 leagues, the northernmost of which, called Ship Channel Key, lies E. by S., 10 leagues from the east end of New Providence.

Between the bank which surrounds the Cat Islands and the east edge of the Great Bahama Bank, is a channel 6 leagues wide, called Exuma Sound, on the western side of which is a key, called Leeward Stocking Island; and farther northward, between Ship Channel Key and the bank that surrounds Eleuthera, is Rock Sound, of about 4 miles in width, at the north part of which you suddenly find 2 fathoms water; this is denominated the Twelve Feet Channel.

WATLAND'S ISLAND, which lies 13 leagues to the east of the S. E. point of St. Salvador, is about 4½ leagues in extent, from N. E. to S. W., and is of moderate height. It has a pretty little town on the south side, and on approaching in that direction, you will see several houses on the summit of a hill, and appearing nearly in the centre of the island. Off the S. E. point are two remarkable rocks, called the Pigeon's Rocks. On the east side of the island are a number of sandy spots. It is one of the most dangerous reefs of the Bahamas, extending about 7 miles, having several rocks or heads which cannot be perceived by the color of the water before you are close upon them, and which have 5, 4, 7, 9, and 10 fathoms water between them, and a current setting W. and W. S. W. into Exuma Sound. Off the north side are the dangerous rocks called the White Rocks, and a reef extends outward 4 or 5 miles to the N. W.: vessels ought, therefore, to be very careful in rounding them. There is a small reef projecting from the S. W. point, but it always shows itself.

Captain Dowers, of the navy, has stated that, in the route from New Providence to Jamaica, in 1814, when "passing along the west side of Watland's Island, about one and a half mile from the sandy beach, with the S. W. point bearing S. by W., just at dusk we discovered a ledge of breakers, (about a ship's length east and west,) close to us.

"When about a cable's length to the westward of them, we had the following bearings, viz.: a remarkable black rock, close to the shore, and breakers in one, E. S. E.; the N. W. point of the island E., the S. W. point S. by E.

"We had 5 fathoms at about 2 cables' length to the northward, and deepened our water gradually as we increased our distance to the westward. No bottom with hand line, about half a mile outside; the water of the same color as the ocean; at this time land was distinctly seen from the mast-head, bearing S. W. and very low."

RUM KEY.—No reef of any extent lies off this island, except Pindar's Reef. This lies off the N. W. part of the island, extending out north about 2 miles. There is a small reef very close in, near the S. E. harbor point. The shore, in general, is bold; and if a trifling reef, shoals, or sunken rocks are known, they are chiefly on the north side of the island, not frequented by any shipping, and lying very near the shore. The S. W. point is a sand spit, with very bold water on either side of it; vessels of any size can anchor within 200 yards, and procure fresh water from wells dug near the beach.

With the exception of Pindar's Reef, vessels of any size can approach with safety any part of the island within a quarter of a mile, and many places (particularly the west end) within 150 to 200 yards.

The west side of Pindar's Reef is very bold; vessels may run a north course so close along as to throw a buiscuit on it. The east part of the island shows white cliffs; more northerly again, black cliffs.

The vessels that load at Old Pond run down the south side in going to sea, round the west end, keeping to the eastward of Little Island, in sight, distant 13 miles, and to the westward of Watland's Islands, about 20 miles from Rum Key.

If the vessels returning homeward cannot pass to the eastward of Rum Key, and are obliged to take the south side, they should keep close in with Rum Key, and well in with the west end, which would allow them to pass well to windward of Little Island. Variation, 5° E.

There are settlements all round the island. Rum Key has two salt ponds; the old salt pond, situated on the south side of the island, nearest the end. The anchorage is good about half a mile from the beach, and will admit vessels of any size, affording shelter from the S. E., E. N. E., and round to N. W. Pilots will go out on vessels making the usual signals. There is always a considerable quantity of large grained salt for sale, and every dispatch given while loading.

Carmichael Pond, a new one, is at the west end of the island, and the facilities for

procuring salt are good; the anchorage, an open roadsted at the west end, and immediately off the pond, is protected by the island, with the wind from N. by E. round to S. E. by S. Not far from the beach is a signal flag-staff; vessels may anchor off it, within 250 yards of the shore. Should the anchorage prove rough, by the wind getting out westerly, vessels can easily weigh anchor and run round Sandy Point. A few minutes after weighing anchor a vessel will be out to sea. The salt is carried along side in boats and put on ship board.

CONCEPTION is a little island, surrounded by a reef, and lies half-way between Rum Key and Cat Island. From its N. E. side a reef extends 7 miles to the N. N. E., which was not known until the year 1812, at which time the British frigate Southampton was wrecked upon it. This reef is accounted one of the most dangerous in the Bahamas, having several dangerous rocks or heads, which cannot be perceived by the color of the water before you are close to them.

ATWOOD'S KEY is 3 leagues from east to west, and narrow from north to south. The island is surrounded by a white shoal, bordered with a reef. Off the west end the reef extends out one league; and under this point, in the extent of another league, along shore, there is an opening or interval in the reef; and here vessels may anchor in the white ground, in 7 or 8 fathoms, but very close to the shore. Off the edge of the white ground, no soundings are to be found. To the east of the island are two small islets; the outer one at a league and a half from the shore; these are surrounded with reefs and white shoals.

Atwood's Key is low, with bushes, and presents the same appearance as the other isles in this passage. Its greatest breadth, which is in the middle, is about 3 miles; for each extreme terminates in a point. The reef on the north side breaks, and extends above 2 miles from the land. The same reef, continuing to the west, forms a head, which is a mile and a half to the southward of the point. "On the south side, about 2 miles from the west point, you may anchor at 3 cables' length from the land, and, for half a league at least, along the shore, sheltered from westerly and N. E. winds. Having brought the west end N. N. W., about one mile off, we saw that end was a point only, and that the other side rounded away E. N. E., full of breakers, which were at least two miles from it; we also saw some ahead of us, and to leeward: we were obliged to haul our wind, and stand for the anchorage afore mentioned, on the south side of the island. This anchorage extends about a mile each way from whence we were, and about 3 cables' length from the island. You may let go your anchor in 8 fathoms, sand and broken shells, but it is not good holding ground."

THE CROOKED ISLANDS.—Of this singular group the best idea may be formed by returning to the particular plan of them. The positions appear to be well ascertained; and particularly of Castle Isle, or the South Key. Pitt's Town, a settlement on the N. W. part of the northern island, is the port of entry.

CASTLE ISLAND is an islet lying off the south end of the southern Crooked Island; between are several white rocks, one of which is very remarkable, appearing, when you first make it, like a white fort or castle, from which the islet takes its name. The position of the islet, previously given, was 22° 7′ 45″ N., and 74° 17′ 30″ W. Mr. De Mayne, in 1815, made it 22° 7′ 37″ N., and 74° 17′ 52″ W. So that its position may be considered as finally determined. Variation, 4° 40′ E.

Between Castle Island and Fortune Island the land forms a great indent, named the Great Bay, at the entrance of which lie the Fish Keys. These keys are not to be approached too near. Between Castle Island and Salina Point, is a fine sandy bay, called Jamaica Bay, wherein ships may anchor in 9 fathoms, well sheltered from S. W. winds. To the N. E. of this bay are two wells, with excellent water, and wood may be obtained.

FORTUNE ISLAND, distinguished by its salt ponds and wharfs, is rather more than 10 miles in length, and 1½ in breadth. It lies nearly N. N. E. and S. S. W. The south end is very bold. Off its north end are two islets; and a little to the north of these islets is a sandy point, known by the name of French Wells. From this a small settlement will be seen on the high land to the northward. A vessel may anchor in 8 fathoms, with the French Wells due east, 2 miles. The anchor should be let go immediately when on the bank, only taking care to pick out a clear spot. At this place are several wells of excellent water, which give name to the point: stock and wood also may be obtained here.

THE BIRD ROCK, or PASSAGE ISLET, is a low islet off the N. W. point of Crooked Island. A very dangerous reef extends 2 miles from it, in a N. N. W. direction; it then trends in a circular direction to the E. S. E., or towards the shore. This reef forms the Bird's Rocks anchorage, which is rather indifferent, the ground being partly foul.

Southward of the Bird Rock is a sandy bay, called Portland Harbor, in the middle of which, close to the beach, is a well of spring water. The best anchorage in this place is off the first rocky point to the southward of the sandy bay, at about 3 cables' length from the shore, in 7 or 8 fathoms. You may anchor as soon as you are on the bank,

with the Bird Rock bearing nearly N. N. W., but without great caution the anchor will be lost.

If you anchor in the sandy bay above mentioned, you must be careful to avoid a rocky head, having only 16 feet water on it, and which lies off the centre of that bay, at about three-fourths of the distance between the beach and the edge of the soundings.

CROOKED ISLAND PASSAGE is the best of all the windward passages for ships to sail through.

The prevailing winds being from the north quarter, as soon as you enter the passage you will find smooth water and plenty of sea room. In the event of its blowing strong from the N. N. W., or N., you will find good anchorage under the south end of Fortune's Island, in 5 or 6 fathoms, about three-quarters of a mile from the shore, with the point bearing N. W. by N., and the sand breaker E. ½ S., just on the edge of soundings.

There is also anchorage at Bird Rock, but the ground is very rocky. Wood, water, and stock can be procured.

Of the Crooked Island Passage, the Count Chastenet de Puysegur says, this is the longest of these passages, but it is far the most convenient for ships coming out of the Bay of Gonaives, or from the southern ports of Hayti, and for those which are bound to the United States. These commonly take their departure from Cape St. Nicholas; and being 2 leagues from the cape in the offing, must steer N. by W., 23 leagues, to make the S. W. point of Heneagua. This course will generally lead 2 leagues to the westward of the point.

When you are opposite the west point of Great Heneagua, at 2 leagues off, steer N. N. W. 2° or 3° W., for 25 leagues, when you will make Castle Isle, which you may approach within two miles, or nearer, without fear. If you should depart from Heneagua in the evening, it would be better to steer N. W. ¼ N. for 17 leagues, to avoid the Hogsties; then to haul up, and make a good N. by W. course; when, having run 8 leagues, you would be one league to the westward of Castle Island. The Hobart Breakers lie about 3 leagues to the S. W. of Castle Island.

Should you make Heneagua towards noon or afternoon, it will be best to drop anchor in the N. W. or Great Bay, and get under way at midnight, or at 2 in the morning, according to the strength of the breeze, and steer N. W. ½ N., until you have run 16 or 17 leagues; then haul up N. N. W., or N. by W., when there will be day-light for any thing through the rest of the passage. But should there be light baffling winds in the night, with probably a weather current, keep the lead going, and you will avoid the Hogsties, as, in advancing towards them, there will be found soundings of 50 to 30 and 20 fathoms.

From the west end of Castle Isle you steer N., or N. by W., seven and a half leagues, to make the west end of Long Key. This course and distance will lead within a league of it. Continue in the same direction, to make Bird Rock, off the western extreme of Crooked Island. Having thus run 6 leagues, you will be one and a half league west of this islet; so that the direct course from Castle Isle to the end of the passage is N. 5° W., 14 leagues.

When you are come to this place, you suppose yourself out of the passage; nevertheless, should the wind happen to the N. E., or E. N. E., you have to fear Watland's Island, which bears from Bird Island N. 4° W., true, 23 leagues; therefore, to avoid it, you ought, in leaving the passage, to keep as much to the eastward as the wind will permit; but should the wind be at S. E., and you steer at N. E., you would make Atwood's Key; so that, keeping the wind when you are out, you must observe not to steer higher to the eastward than N. E., nor more to leeward than N. by E.

DIANA REEF, so called from its having been discovered by his Majesty's packet, Diana, when passing through Crooked Island Passage, in the year 1805. It appears that she had been driven to leeward by a westerly current, and made Long Island; and afterwards, when standing to the S. E., struck soundings on a shoal, which was not to be found in any chart. On the 5th day of December, the latitude observed was 22° 56′ N., and on the 6th it was 22° 54′ N. At 3 A. M., on the 6th, they found 20 fathoms water, and continued to sound regularly, from N. W. to S. E., for about 2 miles, the depth about 12 fathoms, (the bottom plainly to be seen, composed of sand and rocks, like the anchorage at Crooked Island,) then suddenly had no soundings, with 25 fathoms of line. The Commodore, who stretched a quarter of a mile farther northward, had only 7 fathoms. Captain Edgecumb, of the Nassau government schooner, was once becalmed near it, and rowing round in his boat, in one place found only 4 feet water. This reef is supposed to lie about 9 leagues N. W. ½ N. from Castle Island.

CURRENTS.—You have little occasion to fear the currents in this passage, which, in a fresh breeze, are scarcely preceptible; but, in calms and light winds, they may set you to the westward, but slowly and so feebly that, in a passage so short, you need not to mind them, especially as you generally make it with a large wind. Nevertheless, in the months of June, July, and August, when calms or light westerly winds are common, you may experience a current setting to the west, strong enough to alter your course;

which effect only can happen in this passage, and is occasioned by the proximity of the extensive shoals, forming the channel of Bahama, and those of Providence Island. In this season it would be proper, if you have a wind sufficient to make you go more than two knots an hour, to allow a quarter of a mile an hour for the current setting to the westward; if you go three knots and upwards, this allownnce will be unnecessary.

WINDS.—The N. E. trade generally prevails here, except from October to April, which are considered as the winter months: during these months you have, sometimes, strong gales from the N. W. and very variable weather; particularly about the full and change of the moon, which ought to be guarded against.

The MIRA-POR-VOS, an assemblage of barren rocks, with one low sandy islet, lies to the west of Castle Island, in 22° 7′ N., on a shoal similar to that of the Hogsties. They are very dangerous, and should be carefully avoided, particularly when the islands bear in a N. W. direction.

When the wind blows from the northward, they break very heavy, and at all times a heavy swell; the current generally sets from the N. E. one mile per hour. On the western side is an indifferent anchorage; the east side is bold, and on the S. E. side, at a mile distant, there are from 20 to 25 fathoms, coral and rocky ground. As these keys are to leeward, they are not often seen by vessels in ranging along Castle Island; however, if it is necessary to turn, you may approach the bank within half a league. All the dangerous parts break, and the white ground will give you notice in good time. You may, if you choose, pass to the westward of the Mira-por-vos, with the precaution only, of not approaching too near. Captain William Dowers was passing this way in an evening of January, 1814, and came suddenly on a reef stretching out from the S. W. Key, which bore east, 2½ miles. Captain Dowers says, "We had 10 fathoms, sand, while in stays; but observed black rocks and less water in many places.

"This reef appears to run off west for 3 miles, and then extends to the S. S. E. for some distance. We counted ten above water. They are all barren rocks, excepting the S. W., which is a low sandy island, about half a mile in length, and covered with brush-wood."

The Mira-por-vos range nearly N. E. and S. W. The middle of the group bears W., 11 miles from Castle Island. In making them you will gain soundings in 11 fathoms; and at three-quarters of a mile thence may pass to the westward of them; but the general channel is between them and Castle Island. High water full and change 9h. 30m.

TO RAGGED ISLAND, (ONE OF THE BAHAMAS.)—It lies in lat. 22° 8′ N. If bound to it from the Windward Islands, a N. W. course from Cape Maize, will fetch it, distance 45 leagues. Vessels bound to Ragged Island should pass to the northward of Key Verde, in lat. 22° 00′ N., thence steer W. ½ N. by compass for Ragged Island. The island is surrounded by innumerable dangers, whose local positions are but little known. I would advise all masters of vessels bound to it, in coming up the straits, to keep the Cuba shore on board until they run up as high as the well noted high hills of Givari, which is a Saddle Hill; then steer as above directed, and if they exceed 8 feet draft of water, keep the island under their lee, and run the shore close on board until they bring the flag-staff and houses to bear due south, then you will open the entrance into the harbor, when you must haul in S. W.; then ahead of you, a small key, with store-houses on it, will appear, and at your entrance into the harbor, a low black rock will appear on your starboard side; give it a berth, and in running in, you will observe a large red Cal Bank on your larboard side, which you may run close to until you come abreast of a low black point of rock on the same quarter, and when you come abreast of a couple of cannon mounted thereon, you may drop your anchor in 3 or 4 fathoms water, until a pilot boards you, unless he may have met you on the outside. Ragged Island is distinguishable from all other sounding keys by a lofty hill about the middle of it, the number of houses and inclosures, as well as the flag-staff that appears on it. Vessels running far from Cape Maize or Barracoa generally make Key Verde, close up to which, either to windward or leeward, there is plenty water for vessels of any draft. Due south of Ragged Island, distant 4 leagues, there are three small keys close to each other, called the Brothers, that have from 2 to 3 fathoms water close up to them. Kiobano or St. Domingo Key lies S. by E. of Ragged Island, distant 12 leagues, to leeward of which there is plenty of water; but no vessel should attempt to edge the bank to windward of it until you are close under the lee of Key Verde, as there are many dangerous ledges of rocks betwixt them, on the edge of the straits, on which many vessels have been lost.

Remarks on the action of the ebb and flow of tides at Ragged Island, by DUNCAN TAYLOR.—From the first of January to the last of April they flow from 16 to 18 inches, and the tide that flows an hour after the rising of the moon, is uniformly 6 or 8 inches higher than the tide which flows after the setting of the moon.

I have frequently, during the above months, observed them not to flow more than from 6 to 12 inches. The spring tides during the above months, generally rise from 6 to 10 inches higher than the common tides.

From the beginning of May to the first of October, both tides gradually flow till they arrive at the height of from 10 inches to 2 feet 4 inches, and from 18 inches to 3 feet 6 inches, and then continue diminishing until the month of January.

Directions for sailing from Jamaica, through the Windward Channel and Crooked Island Passage.

Those who are bound from Jamaica to Europe, or any part of the north-eastward, it is recommended, if possible, to take the Crooked Island Passage in preference to any other. From Point Morant, Jamaica, you should endeavor to gain easting as soon as possible; and by taking advantage of the wind's shifting from N. N. E. to east, which it generally does in the night, you will gain ground very fast; and by working up under Cape Dame Marie, on Hayti, you avoid a strong set to the S. W., caused by the trade wind.

There is found, however, at times, great difficulty in working around Cape Maize, owing to the strong lee current which generally prevails with a strong N. N. E. wind, particularly in the months of January, February, March, and April, during which months the strong northerly winds prevail. This current is found to run strongest between Cape Maize and Cape Dame Marie (or Donna Maria,) the stream occupying a space in breadth equal to the distance between the contracting points, and runs at the rate of two knots an hour, setting, during the strong N. E. winds, to the S. W. between the N. E. end of Jamaica and the Morant Keys.

Some commanders, after clearing the east end of Jamaica, have stood over to the Cuba shore, in order to round Cape Maize; but they, also, have found a strong lee current, and having little or no land wind to assist them in working along the south side of that land, in the months above mentioned, they have at least been obliged to bear up for the Gulf Passage.

It is to be understood that the following directions are not intended as a standing rule for working, at all times, around Cape Maize. In the fine season there are variable winds, and the current is sometimes in your favor, of which every advantage should be taken, according to circumstances.

In sailing between Cape Maize and Cape St. Nicholas, the Montagnes de la Hotte, or Grand Anse Mountains, (the westernmost high land of Hayti,) are often seen. They may be descried at the distance of 30 or 40 leagues: and by their situation and bearing, become a good guide in working up the Windward Channel.

In sailing from Port Royal to windward, and finding a strong lee current against you, stand well out, and work in the stream of the Morant Keys, endeavoring to get to the eastward of those keys as soon as possible. The Morant Keys are by no means dangerous, as they can at all times of the day be seen at a sufficient distance to avoid the dangers that surround them; under the N. W. side is anchorage.

Having made the Morant Keys, stand well to the eastward, and keep working, in a direct line, for the high land over Point Boucan, which is to the E. S. E. of Cape Tiburon; and by not standing further to the westward than with Cape Tiburon bearing N. E., you will avoid the stream of the current, and gain ground very fast. When you have advanced as far to the northward as 17° 40′, you will sometimes meet with a counter current, and it frequently happens, particularly in the night, that squalls are met with from the southward, which are caused by the high lands of Hayti. In this case, keep well to the eastward of the Isle Navaza, between it and Cape Tiburon. With frequent flaws of wind in your favor, endeavor to get close under Cape Tiburon, and keep working along that shore, which is very bold, to Cape Dame Marie; and, by not standing further off shore than 7 or 8 miles, you will find very little current *

In the channel between Cape Nicholas and Cape Maize, the current sets with great strength, particularly on the Cuba side, where it however varies with the seasons. It is, therefore, necessary to work up to Cape Nicholas before you attempt to weather Cape Maize; and by keeping within the line of Cape Nicholas and Cape Dame Marie, you will work to windward very fast. When Cape Maize is brought to the westward of north, you may venture to stand across the channel to the northward, and you will generally, as you stand over, find the wind more easterly. Fetch over to the Great Heneagua, as that island should always be made if possible.

In proceeding from off Cape Maize for the Crooked Island Passage, make the land of Heneagua if it be possible, as short departures are best in navigating among these islands, particularly as the currents are found in various directions.

On proceeding from Great Heneagua to Castle Island, you should leave Heneagua so as to allow sufficient time for entering the Crooked Island Passage before dark, or in the evening, so as to arrive there by day-light in the morning. The latter is generally preferred. The course from Great Heneagua to Castle Island is N. W. by N.

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* It has, however, been observed that *by keeping too close in* with the land about the S. W. end of Hayti, you may be becalmed for a month.

Having entered between Castle Island and the Mira-por-vos, the course to Long Key is N. by W. $\frac{3}{4}$ W. 7 or 8 leagues. Towards the northern end of Long Key is a rise of land, with a flag-staff on the summit. In advancing towards this place, you will perceive a sandy point, called the French Wells, off which there is good anchorage for men-of-war, in 7 fathoms, about two miles from shore.

From abreast of Fish Keys to the Bird Rock, off the N. W. point of Crooked Island, the course and distance are north, $8\frac{1}{2}$ leagues. You may run along shore, there being no danger but what may be seen in the day. The Bird Rock lies in lat. 22° 48′ 50″, long. 74° 19′ 25″.

When you get abreast of this Key, you may with safety haul up N. E., if the wind permits, to go clear of Watland's Island. It is very dangerous to approach Watland's Isle in little wind or calms, the current setting wholly on it: as it is very rocky and steep to, there would be no possibility of saving the ship. Capt. Hester observes, in his Journals, that it had been remarked of late years, by those who have passed both ways through the Crooked Island Passage, that in going to the northward you can seldom clear Watland's Island, after you have passed Crooked Island, without beating to windward; and going to the southward, after you are past the Mira-por-vos, and the Hogsties, it is difficult weathering or rounding Cape Maize.

BROWN'S SHOAL.—For our knowledge of this danger we are indebted to Capt. Livingston, who has given us the following account of it:—"Brown's Shoal, 10 leagues S. S. E., by compass, from Key Verde, was seen by Capt. William Brown, of the schooner Union, of Plymouth, Mass., who stated to me that it is of considerable extent, and that, from the manner in which the sea broke over it, he does not suppose there can be more than 2 or 3 feet of water on the shoalest part. Latitude and longitude inferred from the position of Key Verde, 21° 30′ N., and 74° 52′ W.

The HOGSTIES are three low keys, encompassed to the eastward by an extensive reef. They lie at the distance of ten leagues N. by W. $\frac{3}{4}$ W. from the N. W. point of Heneagua. About them are many rocks and broken ground, and when it blows hard the sea breaks over them all. The southernmost is the smallest, and bears from the middle key, which is the largest, S. S. E. The smallest requires a good berth, it being shoal all around; but you may sail close to the largest, and anchor in 4 or 6 fathoms, with that key bearing E. S. E. About a mile to the westward of the Hogsties is a depth of 18 and 20 fathoms.

GREAT HENEAGUA.—Great Heneagua is rather low, and cannot be seen at a considerable distance, in consequence of the haze which constantly prevails in these latitudes. In making the west end there is no danger whatever. Two sandy bays at that end afford good anchorage. From the trade wind's blowing over the island, the northernmost bay is the best. Stand in, and you will perceive the line of soundings by the color of the water, extending about half a mile from the beach. So soon as you are in soundings, let go your anchor in 6 or 7 fathoms.

This island is about 15 leagues in length, and 10 miles in breadth. The body of it lies in lat. 21° 5′ N. Fresh water may be procured in the northernmost bay, on the west side, at a small distance from the beach.

A shoal, marked doubtful, which is exhibited on some charts as lying off the S. W. end of Great Heneagua, has been carefully sought for, and said not to exist, but we think otherwise.

M. Chastenet de Puysegur says, "Great Heneagua, like all the islands which bound the Windward Passages, is very low, with small hummocks, which, at a distance, appear like detached islets. The land, in clear weather, may be seen at the distance of 5 or 6 leagues, and you need not fear coming within half a league on the western side. In a fine bay which you leave on your starboard side when going through the passage, you may anchor on white bottom, choosing your ground by your eye, as in many parts of such bottom there are stones which sometimes rise to a considerable height above the level of the sand."

There are some rocks about the S. W. point, with a reef which stretches out to nearly the extent of a mile. In the bay between this and the west point, called Shallow Bay, you may anchor close in. The bay is surrounded by a reef, which, however, shows itself, although there are 2 or 3 fathoms over it. Without the reef is a white sand, to the distance of 3 cables' length, and on this is the anchorage, in 7 or 8 fathoms. Farther out, in a line between the two points, which lie S. S. E. and N. N. W. from each other, in 15 fathoms, is rocky ground. This bay is not so deep as the Great Bay, but, as the bank is less steep, ships are not so liable to drive here; neither is the landing so easy, but there are clear places in the reef. There is no water but in the rainy season; then it is not very good, as it lies among the mangrove bushes.

THE GREAT BAY is sheltered from the north by the N. W. point, and from the south by the west point. This bay is two and a half leagues wide, and one deep; and all along the shore there is a border of sand 4 cables' length wide, on which you will have 5 fathoms, at a pistol shot from the shore, to $15\frac{1}{2}$ fathoms; and at half a cable's length from that, 45 fathoms of water. If you should be there in the season of the norths, you

may anchor under the N. W. point, so as to be sheltered from the W. N. W.; and if there when the southerly winds prevail, you may anchor under the south point so as to be sheltered from the W. S. W. There are not more than four or five points of the westerly winds which could hurt you; but they are not to be feared, as they seldom blow, and never violently. It is easy landing all round the bay.

Having rounded the N. W. point, you will see a little islet to the E. N. E., and a ledge of reefs for more than a league along the shore, and upwards of a mile from it. This coast will be known by a hummock, (le Mornet,) the only one on the north side, which is lower than the south, and covered with bushes.

At the eastern part of the north side of Heneagua is a bay, 3 leagues wide, and nearly one deep, where you may anchor, but will be sheltered from southerly winds only. This bay is little known. At about a mile from the S. E. point is a little islet, and around it the bottom appears white: upon this you may anchor at about a musket shot from the island. The white bottom continues along the south part, with here and there some reefs with breakers.

BISHOP'S REEF.—This is a very dangerous reef, bearing, by compass, E. S. E. from the rock at the N. E. point of Great Heneagua. Capt. Livingston, who has given us the information, says, "I saw it in September, 1816, on my passage from Jamaica to Charleston, S. C., in the brigantine Agnes, of Greenock, then under my command. The sea broke very heavy on it, and, from appearances, I cannot suppose that there are more than 3 to 5 feet water on the shoalest part of it. The white water showed at a considerable distance to the eastward of the breakers, and I am disposed to think the shoal extends fully 2 leagues out from the N. E. end of Great Heneagua; but I conjecture there is a passage between it and the island.

"I was informed by the late Francis Owen, master attendant of Port Royal, Jamaica, that the Statira frigate was lost upon this shoal; and Mr. Owen mentioned that it had been seen many years ago by Mr. Bishop. The variation here is only about one-quarter of a point easterly, but it increases near St. Domingo."

In his notice of a rock, supposed to be this, Mr. Bishop says, when it bore N. W. ½ W., distant about 2 leagues, they saw the ground under them, having no more than 3½ fathoms water; therefore hauled up S. S. E., and kept the lead going till they had from 3½ to 4, 4½ to 8, 10 fathoms, and then no ground.

LITTLE HENEAGUA.—This island, which lies to the northward of the N. E. point of Great Heneagua, is low and uneven, except a little mount or hummock, which is at an equal distance from the N. E. and S. W. points; not far from the shore, almost round the island, it is sandy, except at the S. E. point, where a ledge of rocks stretches off and breaks, nearly one mile and a half. On the south side there is a white bottom, bordered with a reef, at the foot of which is a depth of 40 fathoms. This island is divided from Great Heneagua by a deep channel, a league and a half in breadth.

CUIDADO REEF.—The shoal thus named lies to the northward of the eastern side of Little Heneagua, beairng N. ½ E., by compass, 6 leagues from the body of that island. S. S. E. ¼ E., 10½ leagues from the S. W. point of Mogane, and N. W. by W. ½ W., 10 leagues from the West Cayco, is a very dangerous reef of sunken rocks, called by the Spaniards the Cuidado Reef. The body of it lies in about 21° 53′ N., and 72° 55′ W. This reef was seen in passing by Mr. De Mayne, in the Landrail, surveying cutter, 1816, and is particularly to be noticed as lying in a direct line between Little Heneagua and the east end of Mayaguana, and only a few miles to the west of a line between the West Cayco and the S. W. point of Mayaguana, being nearly in mid-channel between each.

MAYAGUANA is an island, 8 leagues in length, between the parallels of 22° 18′ and 22° 30′ N. It is surrounded by a reef, which runs above a league and a half to the eastward. On the eastern part of this reef are several keys, and 5 or 6 huge rocks above water. Near the northernmost point of it is an islet, three-quarters of a mile long, with a small key to the S. W. of it. The rest of the reef is bordered with rocks under water, on which the sea breaks. On the south side is a passage for small vessels to go through, and be shelteted by Mayaguana on one side, and the reef on the other.*

From the S. W. to the N. W. point of Mayaguana, the coast is clear, and forms two bays, the bottoms of which are of white sand, where you may anchor at about two cables' length from the land. The two points lie N. N. E. and S. S. W. from each other, distant 7 miles. It is very necessary to be acquainted with these anchoring places, as you might be caught here with a north; then it would be better to anchor under the N. W. point, where you would be sheltered from the N. N. W., N. E., E. S. E., and as far as the S. S. W., and that by the island and reefs, which run a long league to the N. W.,

* Captain M'Gowan was lately cast away on Mayaguana Reef. He says it lies a mile and three-quarters farther out than the charts show. I previously considered that it did, a mile and a half. He has, I understand, determined the position of some points in the Passage Islands, and found a spring well on Heneagua; a matter of much importance under a tropical sun.

and on which the sea breaks with great violence. From the N. W. point the coast inclines to the E. and E. S. E., forming a kind of bay, bordered by reefs 3 miles from land, and having some passages for very small vessels. At the east point of this bay, a little inland, are two little hillocks; then the coast trends E. S. E. full five leagues to the east point, which we have already described. Mayaguana and Caycos Islands form the Caycos Passage.

The FRENCH KEYS, between Mayaguana and the Crooked Islands, have been described by the pilot of the Eagle, a French bark, as follows: "These keys, hitherto but little known, have been said to be three; but what probably gave rise to that, was a rock which appeard out of water as high as a boat. It is about half a mile to the N. E. of the largest island, among the reefs and banks east from which, 4 miles distant from the N. E. point, lies a dangerous rock, even with the water's edge. Says the pilot, "we stood for the French Islands, and anchored in the white water on the west side of the largest, about two cables' length from it, sheltered by a reef, which runs to the N. and N. W. 2 miles.

"This island is no more than 3 miles north and south, and half as much east and west. The east and north sides are surrounded by reefs which break. The anchorage is about three-quarters of a mile from the south point, near which is a landing place; and by digging two or three feet in the sand, you will get good fresh water. Some English people, who were wrecked here, had made a pond, which dried up on the Eagle's filling four casks out of it, but in a quarter of an hour it was as full as ever. It is very surprising, that at about ten paces from it there is a salt water pond. This island is low and almost even; though when you are at a distance there appear some small risings, which diversify a little its appearance. The ground is nothing but sand or rock, with some bushes upon it, fit only for firing. The other island, which is the smallest, lies east and west, about two miles to the eastward of the first; but the passage between them, made very narrow by the reefs on both sides, is not a mile wide, and is fit only for small craft."

On Mayaguana and Atwood's Key Passage; translated from the French.

This passage may be very useful and convenient:

1. For ships intended for Crooked Island Passage, and meeting, after they are past Heneagua, with the wind at north, N. N. W., or N. W.; then, not being able to sail up to Castle Island, they are obliged to sail to the southward of these islands, going along the Planas or French Keys, and between Mayaguana and Atwood's Key.

2. For those intending to go through this Caycos Passage, who, when advanced to the West Caycos, if the wind is at N. N. E., would be obliged to sail to the southward of Mayaguana, and to pass between this island and Atwood's Key.

3. When they are about passing between the two islands, if the N. N. E. wind is too near, they may advance westward, and sail between Atwood's Key and the Crooked Island.

It is therefore of great importance that you should be acquainted with the dangers, and also with the places where you may anchor about these islands. If, in going for Crooked Island Passage, the wind obliges you to pass to the southward of the Crooked Islands and the French Keys, it is usual to sail mid-channel, between the Hogsties and Castle Island, from which they are distant 11 leagues, and then make the Planas, which are in lat. 23° 43′, or thereabout. They bear N. by E. from the Hogsties, about 20 leagues, and lie 5 leagues to the eastward of the N. E. point of Crooked Islands. You may safely pass them and the latter, keeping mid-channel, or rather over to the French Keys; for in case of necessity you may anchor on the west side of the largest of them.

Passage between Crooked Islands and Atwood's Key.

Those who are obliged to pass to the westward of the French Keys, may go between Crooked Island and Atwood's Key, which is a very good passage, 5 leagues wide. After having the French Keys about a league to the eastward of you, make your course N. N. E., a little eastwardly, 10 leagues; you will then get sight of the east point of Atwood's Key, which you must not approach nearer than 4 or 5 miles; but having brought it S. W. from you, 2 or 3 leagues, there is nothing to be feared.

It is necessary to observe that the norths in this passage are very dangerous winds, and may throw you upon the reefs, which border all the banks on the east side of the Crooked Islands: this happened to the French man of war, the Orox, 1736, which was very near being wrecked, and was obliged to anchor close to them in foul ground.

Being in sight of the French Keys, you may also, according to circumstances, pass to the southward of them, giving them a berth of 4 or 6 miles: and, having cleared them, stand away to the northward, to sail between Atwood's Key and Mayaguana, which is a fine clear passage.

The CAYCOS.—The Caycos are an assemblage of several islands and islets, which inclose a white bank, some parts of which are very shallow, and others tolerably deep.

There are four principal islands, viz., the Grand Cayco, the North Cayco, the North-west or Providence Cayco, and the Little or West Cayco: these form a semi-circle from the east to the west, round by the north, and are terminated on the south part by a great bank, on which there are from 3 to 15 feet of water.

The northern part of these islands is bordered with a white shoal, on which is a reef, extending half a league from the shore; at the N. E. part the white shoal extends outward a whole league; and, at its extremity, is a reef called Basse St. Philippe, or St. Philip's Reef, on which the sea breaks with violence. At a cable's length to the north and the east of this shoal, you will not have less than 7 fathoms. South of it the white bottom extends to the south, and approaches imperceptibly towards the shore; you find 4 or 6 fathoms between it and the shore, which in an urgent case leaves a sure passage.

From the south point of the Little Cayco, a chain of breakers extends to the east three leagues, after which they decrease, trending southward, to join a sandy islet called French Key. This is low, with some bushes on it, and bears from the south point of Little Cayco nearly E. S. E., five leagues. The reef from the French Key stretches to the south seven and a half leagues, to join another sandy islet, which has not more than 20 paces extent, and is entirely drowned at high water; all this part of the reef is bold, and, as the water breaks pretty strongly upon it, you readily see it; but, south of the sandy islet, there are no breakers, and you cannot have notice of the edge of the bank, but by the whiteness of the water.

From this sandy islet the bank sweeps a short league to the south, then to the S. E. six leagues, whence it trenches to the east five and a half leagues, and N. N. W. two and a half leagues to abreast of the southern islets, which are situated more than a league within the white water.

From the sandy islets, as far as abreast of the southern ones, the bank is very dangerous; you cannot see any land, and come suddenly from a sea without bottom into 2 or 3 fathoms. The color of the water is the only thing that can warn you of the danger; and this is by no means certain, for navigators, accustomed to see on the surface of the water the shadow of clouds, which sometimes has the appearance of shoals, are often lulled into a fatal security. No motive then ought to induce you to approach this part of the bank, and you will do right to keep at a good distance.

If, after having been turned to windward several days in this neighborhood, you have not seen the land, the safest way is never to cross the latitude 21° in the night, but to wait for day-light; then, should you perceive any change in the water, which indicates white grounds, without seeing either land or breakers, you may be sure you are on the western side; when you may steer N. W. ½ W. to fetch the Little Cayco, and go through the passage to leeward of these islands.

Should you see the southern islets bearing about north or N. W., you may stand on upon the white water, in from 7 to 12 fathoms; then make a tack or two to get to windward, and go through the Turk's Island Passage, which is to windward of the Caycos.

So soon as you see the southern islets, the bank is no longer dangerous, and you may go on it as far as one or one and a half league: south and S. W. of these islands you will not have less than 7 fathoms, and generally from 9 to 11.

The channel between the Caycos and Turk's Islands is six leagues across in the narrowest part: it is a good passage, and without any danger; * you may come within half a league of the Caycos, and on the eastern side of the islets, without fear. Through this passage you may turn with great safety, and will not feel the current, if you do not come within one and a half league of the shore.

You will find an anchorage on the white shoals, near the south point of the Great Cayco, which may shelter ships that do not draw more than 15 or 16 feet; west of this point there is a fresh water lagoon.

The best anchorage for small vessels is to the west of the North Cayco, near the small Island of Pines, in the inlet which that island makes with Providence Island. Within the reefs that border that part of the coast, lies L'Anse a l'Eau, (Watering Bay) where you anchor in 3 fathoms, upon a white bottom: there is good water, and it is the watering-place of the Providenciers. You will discover the entrance of the bay, by coasting along the reef, from the rounding in of the coast, after passing the west point of the Three Maries and Booby Rocks. When you perceive a great extent of white water within the reef, you must send your boat to find the channel, and moor her in it, making use of your lead: and, if you want to get in, be not afraid of coming near the reef. When you are once within the reef, you may let go your anchor in 3 fathoms: you may go farther in, by towing or turning with caution; the entrance is not more than half a league or two miles from the shore.

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* A shoal called the Swimmer Bank, lies on the western side, as shown on the Chart. This shoal was discovered some years since, by Mr. Cooper, master of the vessel Speedwell, and bears from Grand Key S. W. by W. six and a half leagues. It is dangerous, and should not be approached without great caution.

At the N. W. point of Providence Key, the reef terminates. There is anchorage off the coast in 8 or 10 fathoms, but you must range the shore pretty close to be on the White Shoals, bringing a steep hummock, seen a quarter of a league inland, to bear S. W.; then you will see the shoal recede a little from the shore, and afford a large space for the turning of the ship. Four miles south of the N. W. point, a reef commences from the coast, running S. W. westerly 2¼ leagues: this reef is terminated by a small sandy islet, almost under water.

From this sandy islet the reef runs in to the eastward, and afterwards trenches out to join the north part, off the Little Cayco, which is surrounded with white shoals.

The Little Cayco bears S. W. by S. from the N. W. point of Providence Cayco, which is of a middling height, and of a white color; you may range along the N. W. part, close to the edge of the white grounds; the west part is very bold to the south point, where you may anchor in from 5 to 7 fathoms, on the white bottom.

Of the Caycos and Mayaguana Passages, Captain Livingston has said, "For vessels bound from North America to Jamaica, I consider the Caycos Passage preferable to that of Turk's Islands, which has been commonly used; because, if you can only distinctly make out the N. W. point of the Caycos, and bring it to bear E. or E. by N., however dark the night may be, you may run safely, steering at first S. W ½ W. by compass, 5 leagues, and then S. by W. till day-light; by which course you run no risk, either from the Caycos Reefs or the Heneagua; and, however fast your vessel may sail, you have more distance than you can run in one night before you can make Hayti or St. Domingo, By steering this course, or rather these courses, you also avoid all danger of being dragged by a lee current down upon the coast of Cuba."

The Caycos Passage is also recommended as the best passage for ships bound from Cape Haytien, formerly Cape Francois, when the winds are not steady from the E. S. E. You will always go with a large wind, which is of great advantage; and will avoid all the white grounds to the S. E. of the Caycos, which it has been customary to make. This custom of coming to the white grounds is very dangerous; but there is no risk in making the land some leagues to leeward of the Little Cayco.

In leaving the cape, you must steer a N. by W. course; and after having thus run 35 leagues, you will find yourself 2½ leagues S. W. of the Little Cayco; then you may haul your wind, first as high as north only, on account of the reefs of Sandy Key, which lie to the north of the Little Cayco; after which you may steer N. by E. 5 or 6 leagues, when you may haul up N. E., or continue to steer north, without any fear. Having run 10 or 12 leagues on this course, you will be out of the passage.

If, when you are two leagues S. W. of the Little Cayco, the winds do not permit you to steer N. by E., or to make a good north course, after having run 13 leagues, without getting sight of Mayaguana, the best way, if night comes on, is to tack and stand to the S. E. 3 or 4 leagues; then tack again to the north, and you will weather, by 3 or 4 leagues, the breakers off the east point of Mayaguana.

If, when you are to the S. W. of the Little Cayco two or three leagues, and the wind will not suffer you to lay north, you must not attempt to go to windward of Mayaguana, but must fetch the channel between it and the French Keys. You steer for it N. W. ½ N. Having run 18 leagues, you will come in sight of the S. W. point of Mayaguana, which ought to be north of you, two leagues distant; you do not run any risk in approaching this point, which is safe. A small white shoal extends from it, with three fathoms water on it, almost close to the shore. *

When you have doubled the west end of Mayaguana, so as to bring it to bear east, you may, if the wind permits, steer N. In that case you will pass 4 or 5 leagues to the windward of Atwood's Key; but if your course is not better than N. by W., after having run on 12 or 13 leagues, and the night comes on before you can see that island, tack and stand on for 5 or 6 leagues. Then, if you can make good a N. by W. course on the other tack, you will weather the eastern breakers of Atwood's Key, at about 3 leagues. Should you be 2 leagues from the west point of Mayaguana, and the wind will permit you to make a course only N. N. W., after having run thus 6 leagues, you will see the French Keys, bearing nearly W. N. W., 2 leagues. You may pass to windward or to leeward of them, as the wind may admit. When you are 2 leagues N. N. W., or N. W. by N. from them, upon running in that direction, 12 or 13 leagues, you will be out of the passage. You must not go in the least to the northward of this course, as the breakers off the west point of Atwood's Key bear nearly N. N. W. from the westernmost of the French Keys.

The French Keys are very low; they bear from the S. W. point of Mayaguana N. W. ¼ N., 8 leagues. You may go pretty close on the east, north, and south sides; the white bottom which encloses them being pretty steep. On the N. W. of the large island, the reef running out some little way, it is necessary to give it a good berth. You may an-

* The Cuidado Reef, which lies to the westward of Caycos Passage, has been previously noticed. It lies in a direct line between Little Heneagua and the east end of Mayaguana.

chor in the S. W. part on the white bottom, but very close to the shore. There is a small lagoon of fresh water, supplied entirely by the rain. The isles have been previously described.

On leaving Cape Haytien, you will generally find the wind at S. E. or E. S. E., and near the shore the current runs to windward: these are two powerful inducements to engage you to steer N. E., or N. N. E., for the Turk's Island Passage: but, at about 10 or 11 o'clock, the wind generally chops round to the E. N. E., or N. E. Being then 5 or 6 leagues from the coast, and the current no longer felt, you would necessarily make the white grounds to the southward of the Caycos. This circumstance has caused many shipwrecks, merely from the eagerness of going 20 leagues to windward, in a voyage of perhaps 1500 leagues. Under these circumstances, I would advise mariners from the cape to steer at once for the Little Cayco.

Additional Remarks on the Coasts, Isles, &c., which form the Windward Passages, by several French and English Navigators.

CAYCOS PASSAGE, &c., by Captain Hester.—After having cleared the east end of Jamaica, says the Captain, I would endeavor to get to the eastward as fast as possible, taking every advantage of wind. In so doing, when advanced to Cape Nicholas, I would prefer the beating up as high as the Island of Tortue, (or Tortuga, or Turtle Island,) and take my departure for the Caycos Passage, thinking it less tedious and difficult than the passage by Crooked Island.

From the Mole to the west end of Tortue, in latitude 20° 5′ 20″, the course is N. E. by E., about 11 leagues. It is all a bold clear shore, giving it 2 or 3 miles berth. The N. E. part is foul 3 or 4 miles, but from that part down to the west end it is bold; and the west end is as steep as a house-side. When the high hill, which is seen over Point Paix, bears S. W. by S., then the east end of the island is between you and it.

From off the middle of the Island Tortue, to go between Heneagua and the Caycos, take your departure in the evening, steering north by compass, taking care not to run more than 18 leagues at the most before day-light, with the distance off from it included, at taking your departure; when, if you see nothing of the east end of Great Heneagua, continue your course for 7 or 8 leagues, and you will not fail of seeing the Little Caycos, or Little Heneagua.

You may borrow near to the Caycos, and haul your wind to N. E., which will clear you of Mayaguana and its reef, the outer point of which lies in latitude 22° 20′, then you are in the open ocean, clear of every thing.

If you find a leeward current, or a scant wind, between Heneagua and the West Cayco, so that you cannot weather Mayaguana and its reef, you may bear up and sail under the lee or west end of Mayaguana, there being no danger but what you may see, to sail between Mayaguana and the French Keys, which is a wide and fair channel. Then you haul your wind to windward of Atwood's Key, which lies in latitude of 23° 11′. In going through either of these passages, there is a greater advantage gained, with less trouble, and sooner, than by Crooked Island Passage. Though I think that, in time of war, it would be very tedious and difficult to attempt any of them with a convoy; not only because you are infallibly exposed to be annoyed by cruisers and privateers, but also because of the almost impossibility of keeping a number of vessels together in these narrow channels. As for the Turk's Island Passage, in sailing to the northward, I would not offer to mention it, looking upon it to be both tedious and hazardous: but in coming from the northward, it is, in my opinion, a very easy, safe, and expeditious passage.

Caycos, &c., translated from the French.

The Little Cayco extends N. N. E. and S. S. W., about 7 miles, being its whole length. You may anchor all along the western side, there being 4 or 5 fathoms water close to the land; but it is a hard bottom, and too near the shore. At the N. E. point is a bank of rocks, extending to the N. E. near a mile, on which the sea breaks; there are 2 and 3 fathoms close to it.

The length of the Little Cayco has been measured in a boat in a fresh breeze, and smooth water; the log hove frequently, and there was not any difference in the going and coming back, therefore it is probably very exact. This island is of low land, whose border is of sharp stones, which resound like a bell; it is the worst ground which can be seen: there are neither salt-pits, savannahs, nor fresh water. On the north side, about 200 paces from the shore, there grow in the sand a few lataniers, which always denote a bad ground: the inland parts are covered with bushes. There are some ponds with brackish water; and, as rain is not uncommon here, people who have the misfortune to be cast away on this isle, may obtain fresh water.

By good observations, the latitude of the S. W. point is 21° 36′, longitude 72° 26′; you may run along the south side, very close to it, upon the White Bank, in 5 or 6 fathoms, and no reef. When that point bears north, you have a full view of all the Caycos

Bank. This elbow is a shelter against the north, for there are 5 or 6 fathoms of water close to the breakers, which are very near the land.

Although the west side of the Little Cayco is quite clear of rocks, and there are 6 or 7 fathoms within musket shot of the shore, so that you may anchor there; yet the best place to anchor (and which is most known) is under the N. W. point, rather within it, in 8 fathoms, sandy bottom: there you are sheltered from easterly breezes. It is prudent, however, to have another anchor S. by W., in 14 fathoms, clear ground: this precaution will secure you against a sudden westerly wind; and by that, in case it should continue, you get easier under way.

The north side of the Little Cayco is covered by a reef, beginning off the N. W. point and stretching as far as the Great Cayco. This reef is the only difficulty in the passage between. It is nearly 4 leagues from the N. W. point of the Little Cayco to the N. W. point of the Great Cayco, and the reef extends along that space; that is, as far as the western point of the Great Cayco, which is about 2½ miles distant from the N. W. point of the island. To the southward of the last point is Canoe Cove, (L'Anse au Canot,) the only good anchorage in this western part, of which we shall speak hereafter.

On the west side of the reef there is a little key, called Sand Key, bearing north-westerly from the east part of the Little Cayco. It is very low, and has a reef on its north part. Many ships have been lost on it, by its not having been laid down in the charts; for, after their running along the west side of the West Cayco, they have hauled to the eastward for the Providence Cayco: whereas, when you have run along the former about a league, you should make a N. by W. course, to give a berth to the Little Key, and the reef which stretches to the northward of it.

To the southward of the islet, between that and the reef, is a passage of about 1½ mile to the bank. Without the islets are 10, 8, and 6 fathoms; in the middle 4 fathoms, and within it, 3; but then you immediately come into 2 fathoms.

From Sandy Key the reef runs N. N. E., 2 leagues, being bordered with white water, on which you have 10 fathoms, within musket shot of the reef that joins the N. W. part of the Great Cayco, a little to the southward of Canoe Cove.

It has happened that ships intending to go through the Caycos Passage have made Little Heneagua, either by inattention, or from the currents. To make sure of being far enough to the windward, when bound from Cape Haytien, you should make your course good N., or N. by E. 25 or 26 leagues, and you will see the white water on the banks, which you may run along at the distance of a league, without fear. On the western edge of the bank is the islet called Sandy Key, which you may approach within that distance; then make a N. W. course, and 4 leagues from Sandy Key you will see French Key; when the latter is north from you, thence steer W. by N., 6½ leagues, which will bring you south from the little Cayco; and being past this, you are to make a N., or N. by E. course, as before directed.

According to the survey, made with great care, the white bank and the reef continue between the French Key and the Little Cayco. You may run along them very near, in 10 fathoms, and you will see the openings in the reef, through which small vessels go in upon the bank.

The reef which borders the White Bank, from the Little Cayco to French Key, begins one league east from the former, and it always breaks. You may stand very near it coming from sea; but if you are upon the bank, you must take great care, for half a mile within you will find but 3 fathoms water; and in getting nearer it shoalens very quickly. Here is a great deal of swell, it being open to the breezes. The bottom is sand, and good holding ground.

Particular Observations on the Little Cayco, &c., from the Journal of the Emerald.

"Being at noon, with the Hope, a small vessel, off the S. W. point of the Little or West Cayco, a mile from it, we ran along the west side at that distance, and then made the Hope anchor in 7 fathoms, hard sand, within half a cable's length of the N. W. point. Seeing that the vessel drove, the bank being very steep and narrow, and the weather inclined to be squally, we preferred keeping under sail, and made several trips, keeping well in with the land, at one mile distance. Along the reef, on the west side, we landed very easily in some hollow places, filled with sand, and made by the sea in the sandy stones which compose the island. Opposite these holes, at about three-quarters of a mile from the N. W. point, is the best anchoring.

"The west side of the Little Cayco runs N. by E. and S. by W., about 5 miles and a half. On this side is the anchorage, sheltered from the trade winds: nearer the north part, (which is nothing but a steep border of sand,) at a cable's length, you anchor at about a pistol shot from the shore, in 8 fathoms; at two ships' length there are 15 fathoms; and at half a cable's length farther, there was no ground under the ship. If you want to stay there, the best way will be to have the outer anchor in 15 fathoms water, and to carry another on shore. There is no swell with the E. N. E. and E. S. E. breezes, however hard they may blow."

CANOE COVE.—This little bay is on the west side of Providence Cayco, and may be of great use, as there is water enough for all sorts of ships, sheltered from the norths, which you should always guard against in this passage. The largest ships may anchor in 6 or 7 fathoms, on a sandy bottom, looking out for a clear ground, and here and there you will find it rocky. You are sheltered from the N. to the E., and to the S. E. by S. The anchoring is within the west point, which you bring to bear N., taking care not to come near the reef, which runs round this point for a quarter of a league; the reef ends there, and does not begin again till near 2 miles farther to leeward; then it must bear S. by W. from you.

From the N. W. point of the Little Cayco to this cove, is N. N. W., 3½ leagues; but you must make a more westerly course, in order to avoid the reef and the Little Key already spoken of.

WATERING BAY and PINE'S KEY.—To the N. E. of the N. W. point of Providence Cayco the coast forms a bight, the two points of which are 5 leagues asunder; between them is Watering Bay and Pine's Key.

At this anchorage you are sheltered from the N. E. to the S. S. W., passing by the east.

The greatest advantage of Pine's Key is a great lagoon of fresh water, sufficient for 50 ships: it is very drinkable, and not far from the beach.

The bottom is too white near the land and in the cove for you to catch large fish with a seine; but you must go in a boat on the edge of the reef without; and you will succeed still better, if you sail over with your lines afloat.

From the east part of Pine's Key you may descry all the islands and keys, which are scattered within the Cayco, from N. to S. E.

The following remarks on the Caycos, &c., have been written by Capt. Livingston:

"The whole of the north side of the Caycos is bounded by a reef, through which, though there are various openings, they ought not to be attempted by a stranger without a pilot. Vessels ought not to near the land within a league and a half, in running down to the northward of the Caycos. Watering Bay is extremely dangerous, and is most incorrectly laid down in every chart I have seen. The Providence Caycos is bordered to the eastward, and northward, and westward, by as dangerous reefs as I ever saw; among which, if a vessel once gets embayed, it is next to impossible that she can escape. The American sloop of war Chippewa, the ship Aimwell, of London, and brig Messenger, Kumbley, were all lost upon these reefs in 1816, within a few weeks of each other; and two days after the Aimwell was lost, a vessel narrowly escaped the same fate: to this I was an eye-witness, as I observed the Aimwell on shore before dark, and laid to all night, with the view of rendering her assistance; and when day-light came, I perceived a brigantine completely embayed; and those on baard of her seemed to discover their error, and, profiting by the wind's being at the time off shore, escaped.

"After rounding the N. W. point of the Caycos, and bound to the southward through the passage, having brought the N. W. point to bear E., or E. by N., you may run safely, even in the darkest night, steering at first S. W. ½ W., by compass, for 5 leagues, and then S. by W. till day-light. By these courses you will clear the elbow reef off Sandy Key, between the Providenciers and Little Caycos, and, at the same time, keep sufficiently to windward of the Heneagua and Bishop's Shoal.

The Caycos are connected by a reef of coral rocks, and there is no danger of them in the day, as the white water shows itself. Vessels making the land about dark should never attempt to run through this passage in the night, unless sure of their situation.

TURK'S ISLAND PASSAGE.—There are three principal islands, Grand Turk, Salt Key, and Sandy Key, which they always make who go through the passage.

The western side of these islands is bold, and they may be approached very near, although there is a white shoal, with many rocky spots, which extends about a quarter of a league from the shore.

You may anchor in two places off the Grand Turk; one towards the middle of the island, opposite the huts, the other off the south part of the island; but neither of them can be considered as good. You let go your anchor as soon as you are on the white ground, and take care to find out a clear bottom, as, in some places, the points of rocks rise to within 8 or 10 feet. After you have let go your anchor, and veered to half a cable under your stern, you will not get any ground. Off the south part of the island the anchorage is of more extent, and you will find, on the point near which you anchor, a lagoon of water that may serve for cattle. The white shoal S. W. of Sandy Key decreases gradually to 5 fathoms, half a league from the shore.

East of these islands are several islets, which are connected by white grounds, with very little water on them: they are bold on the east side, and surrounded with a white ground that extends to the southward and S. W.

TURK'S ISLAND PASSAGE.—This passage is very short and good; but you cannot always be sure of fetching it from Cape Haytien. You ought to steer N. E. ¼ E., and the wind often will not admit running so much to the eastward; it is therefore recommended, in leaving the cape, to keep the wind as close as you can, with the early

breeze, and tack so as to fetch the Grange before night. You will generally bring it to bear S. E., or S. S. E. If the ship sails well, or has been favored by the breeze, you may bring it to bear S., whence, making good a N. N. E. course, you need not tack until you have run 18 or 19 leagues. If your last course should not have been better than N. by E., or N., you must be particularly cautious not to pass the latitude of 21°. In the night, when you think you are near that latitude, be sure to sound; and the moment you have bottom, about ship and stand the other way till morning, when you may again tack, and fetch to the windward of the white shoals of the Caycos.

The white bottom is very readily seen: you may run on the edge of the bank to the southward of the Southern Keys for a league, or perhaps a league and a half, in from 7 to 14 fathoms; but farther on there are rocks, with 3 fathoms, at most, on them. In the day-time you may stand on to the northward, (supposing that you have not seen the land,) and you will descry the Southern Keys of the Caycos; or, if farther to windward, Sandy Key. You must be careful not to go to leeward of the white shoals which extend south of a small sandy islet, which is entirely drowned at high water. It is very difficult to be seen, and your lead even cannot give you warning, as you fall suddenly into three fathoms.

To the south-westward of Sand Key lies the Endymion Reef or Shoal, which is described in the following page.

When you have Sand Key bearing E., at the distance of 2, 3, or 4 leagues, steering N. by E., or N. N. E., 8 or 10 leagues, will entirely clear you of the passage. In going through, keep the Turk's Islands side on board, in order to avoid the Reefs of St. Philip, which extend from the N. E. point of the Grand Cayco.

Sand Key is one mile long, and, in fine weather, may be seen 3 leagues off; when you are to the southward of it you would take it for two islands, its middle part being a low drowned land. On the west side are 7 or 8 fathoms, upon the bank which borders the key, at the distance of 3 leagues, and joins a reef that extends a mile from the north point of it.

The south point has, at about two cables' length, three rocks close to each other, by which it may be known; but, to have them open and clear of the land, you must not be far off, nor bring them to the eastward of N. E.

The most certain mark by which you may know Sand Key, is that from the N. E. and the W. N. W.; you will see no other island, and the sand upon it is quite white in the sun. The anchorage is only known by the white water, from 6 to 4 fathoms, within swivel shot of it; but ships which draw much water must anchor about half a mile off, bringing the south point to bear S. E., and the middle of it from E. to E. by N.; the north rocks there cover you as far as N. N. E., and you may easily get under way with any wind, as the norths, which are most to be feared, blow only along the coast, so that the west side may be reckoned a good roadstead. A ship which may, by some accident, have been prevented from sailing through the passage, would find a good shelter here, and might, without difficulty, wait for a more favorable wind. The reef on the north part of the key stretches from it north a little westerly, a long mile, when it makes a little hook to the S. W., but breaks every where, and within pistol shot there are 8 fathoms; though you must not come so near on the other parts of the island, for here and there are some rocks, which have only 2 fathoms water upon them. The east side has high breakers quite to the shore.

Sand Key is low and barren, being burnt by the sun, and continually beaten by the winds and the sea: it produces some small bushes only.

SAND KEY.—Sand Key may be seen about 3 leagues off: it makes at first like three islands, being formed of two little hillocks and a rock, known by the name of Split Rock, though there is water knee-deep between it and the key. This rock serves to distinguish Sand Key, over which it is probable that the sea breaks in all the norths, and other impetuous winds, for it is very low; you may easily land upon it under the hillock, where there was formerly a pyramid.

This key is scarcely more than 1300 geometrical paces (of 5 feet each) long. From the south end the reef runs off three-quarters of a mile S. and S. by W., at the end of which are three rocks, which always break and show themselves. The hillock on the south part is joined to that of the middle part by a low land, which looks like a savannah; and from that to the west point, the land is also very low and even: you cannot land here, nor must you anchor near this part, but towards the south, where all the dangers show themselves. From the N. W. point is a reef to the N. by W. N. N. W., more than 2 miles, and about a swivel shot from the end of this reef, is a large rock, always above water; three-quarters of a mile from which you have 6 fathoms, rocky ground. You cannot land at the east side, which is surrounded with rocks. The anchorage may be made very convenient, by carrying an anchor, with two or three hawsers, to the westward, and then you would clear the island with every wind. But in the months of May and June, you had better anchor about a mile or a mile and a half off, to be less exposed to the swell sent in by the S. E. breeze, which is generally violent.

THE ENDYMION SHOAL has on it 4 feet water, and bears S. S. W. ½ W., 5½ miles from Great Sand Key.

THE SWIMMER, on the S. E. elbow of the Caycos Bank, has but 7 feet water on it, and bears from the Endymion Shoal W. ¾ S., 14 miles distant.

South-west of Sandy Key is a white shoal, extending about 3½ miles from shore, on which may be found from 7 to 9 fathoms.

General Observations on Turk's Islands and Turk's Islands Passage, coming from the Northward. By Captain Hester.

"When bound to the Old Riding Place, at the Grand Turk, your eye must be your pilot, or you will come from no ground immediately into white water, when you must be very brisk in letting go your anchor, as it is very little more than one-third of a mile from no ground to the beach, with not more than 4 or 5 feet water on it; and from the outer edge of the bank to the reef, not above a cable's length distance. It is very rocky ground all in and about the anchorage. Bring the centre of the highest hill you see in the bay, to bear east; then steer right for it, till you come into white water, and you will have 4½ fathoms, white sand.

"From October 6th to October 9th, the north point of the Grand Turk bore north, and the south point S. E., Salt Key S. by W. ¼ W., the body of the town east; the extremes of ditto, N. E. by E. to S. E., distance off shore 1½ mile; distance of the reef 1½ cable: depth of water at the anchor, a quarter less seven: veered out to half a cable, then had 17 fathoms under the stern. The Grand Caycos from W. ½ N. to N. W. by W., wind at E. by N., latitude 21° 28′, variation 6° 40′ E. Tides rise and fall about 3 and 4 feet; a N. N. E. moon makes high water. Currents very uncertain. The autumnal equinox subject to north winds, and rain very variable; the vernal equinox to the contrary.

"Wood may be cut with leave at Grand Turk; water is scarce and very bad. They have no provisions; but turtle and fish may be caught at times. The trade consists in salt, with which they load for America and the adjacent islands.

"The north point of the Grand Turk, lies in latitude 21° 30′. To make this island, coming from the sea, run down in the parallel 21° 40′; when you think you draw nigh them, night coming on and seeing nothing, stand off to the northward, under an easy sail, endeavoring to be as near the same place at day light, as you were the preceding evening; but do not sail further to the westward than what you could see the night before, and keep running down in the above latitude. It may so happen that you will be obliged to do the same thing the second night, if not the third; but that depends on the justness of your reckoning. You cannot well pass the Turk's Islands, in the latitude above said, without seeing them; likewise you would make the N. E. part of the Great Caycos, which lies to the N. W. of the Grand Tnrk. There is a reef which runs to the northward of the latter about two miles, but nothing but what is discernible. The course through is S. S. W. 7 leagues, and then you will be in the open channel, between all the islands and the north side St. Domingo, and may shape your course as you please.

"It is true that the channel between the Caycos and Mayaguana is wide; but when I consider the difficulties which will arise from thick, blowing, hazy weather, and night coming on: from your being more in the stream and way of currents, between the reef off the S. E. end of Mayaguana and the back of the Caycos: from the possibility of driving or passing between them without seeing them, &c. all this would make me give the preference to Turk's Islands Passage. In attempting the Caycos Passage, coming from the northward, you will not be able, (at least it would not be advisable,) to run in the night any more than endeavoring for the other; and in case of a continuation of blowing, hazy weather, you might be puzzled and at loss how to behave, if, (which could very well happen,) you were surprised with the breach of the Hogsties; whereas, by endeavoring for Turk's Islands, though you should pass them, you would be sure of making the Great Cayco; and then it would be but running down back of that isle, and choose your channel and time, either to windward or leeward of Heneagua, having a known departure to go from."

SALT KEY, or the LITTLE TURK.—When you leave Sand Key, and steer for Salt Key, you must make a north course along the reef, which runs off more than one mile; on these bearings from you, you come almost within a stone's throw of it; for at that distance, there are 8 fathoms. Having gotten round the head of it, you are to make a N. N. E. course to the Little Turk, which you may then see; and you will lose the soundings so soon as you have brought the reef any thing to the southward of you. It is two leagues from the reef to the N. W. point of the Salt Key, near which you may anchor; but the bank is very steep: for when your anchor is gone in 5 fathoms, within musket shot of the shore, you will find the ship in 20 fathoms, and no ground a very little way astern. You bring one point N. N. E. or N. E. by N. and the other point S. by W. or S. S. W.; you must look for clear ground, or you will have your cable cut with the rocks. These places are fit only when the trade wind is settled; for you must not be caught here with any other.

Salt Key is N. by E. from Sand Key, and lies N. by E. like the two others; it is of a triangular form, its length something more than three miles: it is higher than Sand Key; and you will see here and there some little risings or hillocks, and a great many bushes and small trees, fit only for fire-wood.

GRAND KEY, or GRAND TURK.—Having advanced to the north point of Salt Key, you will see the Great Key bearing N. N. E. 2½ leagues; so soon as you are clear of the reefs, which stretch off from the Little Turk, two cables' length, it will be found that the bank continues from this N. E. by N., to the south point of the Great Key, for which you should make a N. N. E. course, though you might run along the west edge of the bank in 4 fathoms, or might indeed anchor upon it, as you would be sheltered from the trade wind by the bank and its keys. You must, however, be cautious in steering N. E. of a reef that runs off from Cotton Key W. by N., seldom showing itself in moderate weather, and stretching as far as the south point of the Great Key.

If you mean to anchor on the west side, which is much like the Salt Key, (though not so good as the Sand Key,) you had better keep along the bank, lest you get too far to the leeward, and haul in west from a hillock, which may be plainly distinguished when nearly in; the bank is very steep, and looks shoal; but you will find 4 or 5 fathoms water very close to the land. You must, however, stand in only upon white water, till you bring English Point E. by N.; off that point are some breakers quite close to the shore, and there is shoal water. When the before mentioned hillocks bear E. by S., you may anchor within half a cable's length of the island, looking out for clear ground; English Point will then bear north, and the South Point S. E.; your anchor will be in 4 or 5 fathoms, the ship in 9 or 10, and the stern in 20, 25, or perhaps no ground to be found. It will be prudent in staying here to observe when the trade wind dies, for you have very little room to turn; you should also always buoy your cables, for the sandy bottom is full of large stones, among which cables and anchors have often been lost.

The vessels which load salt, generally anchor to the northward of English Point, that being nearer to the Salt Pond; but neither the shelter nor the ground are so good as at the other place. No passage is to be found to the southward of this island, but for a boat, as there is a reef, which is a branch of that surrounding the weather side of these keys and banks. The Great Key has the best ground of the three islands.

Of the two salt ponds which are on the key, one only furnishes salt; it is about 4200 yards wide, and its middling breadth above 200. It produces three times as much as the pond of Salt Key; but the grain of the salt is coarser, and not so bright as that of the latter.

The latitude of the Grand Turk, by a very accurate astronomical observation, is 21° 26′ 42″ N.

Remarks on the rest of the Keys which are upon the Turk's Islands Bank:

To the windward of the Turk's Island, (that is to say, to the eastward,) are several little barren keys. The northernmost of these are three rocks, called the Twins. They lie three-quarters of a mile east from the south part of the Great Key, and are very nearly together. S. E. one mile from these is Pelican's Key, lying north and south, about three-quarters of a mile long, and very narrow. Bird Key, which is larger, is about 2½ miles in the same line. A reef, with great breakers, runs from one to the other of these keys, ending at another small one, called Breeches Key, which has two rocks at the south end, and is close to the S. E. of Bird Key. To the southward of these you might come in upon the bank, there being from 10 to 6 fathoms of water. Between the N. E. point of Salt Key and Bird Key is another called Cotton Key. It lies nearly south from the Great Key, 4½ miles, and is the largest of all.

SQUARE HANDKERCHIEF, or Mouchoir Quarrè Shoal, is a dangerous and extensive shoal: the N. E. breaker is in lat. 21° 7′ long. 70° 27′. It is a flat shoal, with only 4 feet of water. The extent of this shoal from E. to W. is about 30 miles, and from N. to S. 20 miles. The principal dangers are confined to the N. W. side of it, in which there is a key or bank, on which there are only 8 or 10 feet water. From this shoal the bottom runs E. by N. 7 leagues, to a rocky spot, where the sea breaks with great violence. It is natural to suppose that all the interval is full of sunken keys, which render its approach very dangerous. On the south and south-west parts the bottom shows and gives warning, and you will find from 10 to 15 fathoms; however, the best way is to bear up, and pass to leeward, unless you are sure of being on the east end of the white grounds, and can weather them the next tack.

"Having entered, at 6 o'clock in the morning, the white grounds of the Square Handkerchief, on the south-west edge, we found from eleven to fourteen fathoms, coral bottom. Stood to the N. N. E.; at 50 minutes past 7 sounded in fourteen fathoms; saw ahead, a little to windward, a bottom which appeared nearer the surface; we bore up, but too late, for the vessel was stranded on a sunken key, in 9 feet water. This may show how dangerous it would be to run on these grounds. Close to the N. W. edge of

this key we could get no bottom with 40 fathoms line. This key lies in the latitude of 21° N."

The SILVER KEY BANK.—This shoal has more extent than the Square Handkerchief. The southern point is in the latitude of 20° 13′, and the northernmost part in 20° 55′. It is very white ground in many places, especially in the north part, and very brown in the S. and S. E. parts.

The north and N. N. W. parts have some keys, with no more than 8 or 9 feet of water, and perhaps less; but it appears that these keys are not exactly on the edge. The master of a schooner drawing 9 feet of water, found himself ashore on the Silver Keys, in coming down after he had run near a mile S. W. on very white grounds. The east, or rather the N. E. edge, is very dangerous. In this part there are three keys within a cable's length of the edge called the Triangles; they are even with the water's edge, and lie in lat. 20° 56′ 10′, and long. 69° 56½′, having 16 and 18 fathoms around them. There is also a ledge of rocks marked dangerous, running N. W. and S. E. 3½ miles, on which the ship Oceana was lost in March, 1835. There is a great indraught between the rocks.

The east part of the Silver Keys was explored and sounded in 1753, by Monsieur Le Compt de Kerusoret, who, at that time, commanded the king's ship l'Emerande. In following the details of his route, and trying his longitude, soundings, bearings, &c., I found them to agree so well, that nothing remains to desire on the exact position of the eastern part of this shoal. The western side is safe, and there is a great depth of water; but about 1½ league on the eastern side the bottom decreases, and you see shoals in the N. E. which rise very near the surface.

Ships ought never to venture within any part of the white grounds, because they may often fall from 14 fathoms to 10 feet; if, by accident, they find themselves in the middle of them, the best way is to tack, and go out the same way they come in, ranging along the grounds.

The Silver Key is 11 leagues long, east and west, and 7 leagues broad, north and south, in the greatest dimension. The westernmost part lies north and south from Old Cape François.

You experience on the edges of the shoals weak currents, which generally follow the directions of those edges. On the Square Handkerchief they are scarcely felt; on the S. E. part of the Silver Keys you find them setting to the west and N. W.; but a short league from the grounds their effect is not perceivable.

In general you ought not to mind, in your reckoning, the weak currents which exist in these passages, they being no where to be feared.

SILVER KEY PASSAGE.—Should you, by any circumstance, be forced to go from Cape Haytien, through the Square Handkerchief, you must at the departure make your course good N. E. by E. and E. N. E. If the winds suffer you to steer that course, you would pass in the mid-channel; but if you are forced to turn, and should not get sight of the Haytien shore, after you have once got into the longitude of 70° 20′, you must not pass the latitude of 20° 25′ without frequently heaving the lead. If you come as far as 20° 35′ without getting ground, you have nothing to fear from the Silver Keys, and must only look out for the Square Handkerchief, which is not dangerous on the south, the bottom giving you notice in 10 and 15 fathoms. In the latter case, continue to get to the north-eastward, and when you come into the latitude of 21° 20′ N. you will be entirely out of the passage. A very strong current is found to set to the S. W. through the Silver and Handkerchief Passage, after strong breezes from the N. E., particularly on the decrease of the moon.

THE BANK-BLINK OF THE CAYCOS AND BAHAMAS.—In a letter dated September 30, 1819, Captain Livingston asks, "Has Mr. De Mayne taken any notice of the Bank-Blink? I name this from the Ice-Blink, to which I presume it bears a resemblance.* On the Caycos Bank I have seen it very distinctly in a dark night. On the Bahama Banks I have not had the same opportunity of observing it distinctly, though I have also noticed it there. Once on approaching the Caycos, when coming from the United States, I saw it appearing extremely beautiful, during sun-shine, and consider it as arising from the rays of light reflected by the white sand of the banks in day-light, and the reflection of the white sandy bottom on the atmosphere at night."

Another voyager, on passing over the Great Bank, has made similar remarks on the reflection of light from the white sand of the bank to the atmosphere. His words are, "It was a novel situation to behold an expanse of sea, unbounded by any land, and the bottom, at the same time, distinctly visible at the depth of a few feet. Although the day was cloudless, and the atmosphere uncommonly pure, the azure of the horizontal sky seemed flushed with an infusion of pink color, producing an effect as beautiful as it was singular. We now drew near to New Providence."—*M'Kinnon's West Indies*, 1804.

* The Ice-Blink is an effulgence or reflection of light, seen over the congregated ices, and even about individual icebergs. It enables the mariner to distinguish them at some distance, even in the darkest night.

In allusion to this passage Captain Livingston says, "There was a greenish rather than a pink tinge thrown up over the Caycos Bank, at the time I most particularly remarked it. Some of the fainter hues of the rainbow come the nearest to its appearance at that time."

General Directions making, and navigating on, the Coast of Cuba.

In the rainy season, or season of the southerly winds, vessels bound from Europe to Cuba ought to pass to the northward of Porto Rico and Hayti or St. Domingo; and during the season of the norths, they should pass to the southward of these islands, unless their port of destination requires them to do otherwise. There are other reasons for adhering to this mode of navigating. In Cuba the ports to which vessels are bound from Europe, may be reduced to two: these are the St. Jago de Cuba and the Havana. If bound to the first it is necessary, in every season, to direct your course directly to it; that is, in the season of the norths to steer from Cape Tiburon, the S. W. point of Hayti, in order to make some point on the south side of Cuba, to windward of the intended port, or even to windward of Guantanamo; and, in the season of the souths, to steer from Cape Nicholas' Mole, on the N. W. coast of Hayti, almost west for the port, marking, in the first place, the various points of the coast of Cuba, which are after described. But if bound to Havana, attention should always be paid to the season; that is, if your passage is made in the time of the norths, you should go to the south of Cuba, although you have to return the distance between Cape Antonio and Havana; because this inconvenience is not comparable to that which might be occasioned on the north side by a hard north, which would not only expose a vessel to heavy risks, but might retard the voyage much longer than the time required to reach Havana from Cape Antonio; for this distance may be worked up in a short time, as you may have the assistance of the current to the eastward, as more particularly described in the directions for the Strait of Florida.

Those navigating on the south of Cuba, who have no occasion to touch at Trinidad, or any part of that coast, should give it a good offing, and proceed to the west from Cape de Cruz. Here it may be observed that, at the distance of 35 leagues from that Cape, is the western end of the low island called the Caymanbrack, the N. E. end of which is surrounded by an extensive reef, the making of which is dangerous by night, because a reef extends from it 4 miles out to sea; and allowance must always be made for the current, which, although variable, is generally prevalent here. The safest course appears to be to the northward of the Cayman's; but even here it is requisite to beware of a shoal, on which 14 fathoms have been found, and which was discovered by a Spanish packet bound to Trinidad, in 1800, and there is reason for suspecting that it has spots of very little water. The position of this shoal, according to the last Spanish chart, is lat. 20° 11′ N. long. 80° 38′ W. It had previously been represented more than half a degree farther to the eastward.*

The navigation on the north of Cuba is that of the Bahama or Old Channel. For this channel it is customary to take a pilot, who may be engaged either at Aguadilla, on the N. W. coast of Porto Rico, or at Baracoa, in Cuba, as noticed hereafter. If approaching Baracoa, for this purpose, it will be requisite to determine the ship's place, in the vicinity of Cape Maysi; for otherwise you may happen to fall in to leeward of Baracoa; and even without the necessity of calling for a pilot, it will be proper to make the land in the neighborhood of the cape, for the sake of a departure hence to the westward, and for correcting any error produced by current. The remarkable points of all this coast will be described. These descriptions must, of course, be especially regarded, and strictly attended to.

We have already noticed that in this channel, *independent of any current*, there is a regular tide. The current itself is very uncertain, and no doubt fluctuates according to the variations of the Gulf Stream, winds, &c. It sometimes sets E. S. E., at other times W. N. W., and again ceases. With every precaution, a vessel ought not to cross the meridian of Point Maternillo, without having made and remarked it well; as all the care of the most zealous and attentive navigator may otherwise be of no avail to keep him clear of the Mucaras Shoal, on the north side, which shows no symptom of its existence until a vessel is aground upon it. If obliged to beat up at night, it ought to be done so as not to prolong the tack more than will completely and certainly clear the Mucaras. Having passed over the night in this manner, so soon as it is clear day, steer so as to make the coast, and recognize it well. If it be not in sight, steer to the south until you make it.

Having once recognized Maternillo Point, direct your course so as to pass Guincho, or Ginger Key, at the distance of 2 leagues, if by night; or make it by day, and thence keep over toward the edges of the Great Bank and Salt Key Bank, rather than to the keys of the coast of Cuba, which offer few marks that can be depended on; and an ap-

* The same chart represents another shoal of 8½ fathoms to the north-eastward, in lat. 20° 30′ and long. 80° 27′.

proach to which is therefore dangerous. You will have passed all these keys when abreast of Point Ycacos, and may thence proceed. But the safest way, as before noticed, is towards the southern edge of the Salt Key Bank, passing thence to the westward, according to judgment, the state of the current, &c.

ISLAND OF CUBA.

CUBA.—This is the largest island in the West Indies, and is situated at the western extremity of the multitude of islands, keys, and banks, which separate the Caribbean Sea from the Atlantic Ocean. Its length, from Cape Maize, on the east, to Cape St. Antonio, on the west, is about 208 leagues; its breadth is unequal, being from 12 to 24 leagues.

Cape Maize, the most easterly point of the south part of Cuba, is situate in or near lat. 20° 13½′ N., and long. 74° 1′ W. The point itself is a low beach, and cannot be clearly seen until you are nearly up with it. Landing on it is extremely dangerous, for a reef extends from it nearly a mile to the eastward; and advancing towards it during the night is very unsafe, unless you have previously, in day-light, marked the high lands of the interior country, either of Cuba or of Hayti. From this point the coast trends to the N. W., and rounds to River Maysi, at a mile from the cape. From this river to Point Azules, which is another mile, nearly in the same direction, the coast is bounded by a reef, which extends out about a cable's length, and has a break at the mouth of the Maysi. From Point Azules the land begins to rise, and the coast is clean, and trends about W. N. W. for 5 miles, to Punta Frayle, or Friar's Point, whence it extends west 6 miles, to the River Yamuri, and continues in the same direction 2 miles more, to the Harbor of Mata. All this coast is very clean, and you may run along it within half a mile.

The Harbor of Mata is very small, and too shallow to admit vessels drawing more than 12 feet. To enter it you have only to keep in mid-channel, and anchor in from 14 to 18 feet water, almost in the middle of the bay. All the shores have shoal water from them, so that there is a space of only 2 cables' length in diameter, in which there is sufficient depth for anchoring.

From Puerto de Mata the coast trends nearly N. W., 6 miles, to Port Majana, and at 2 short miles from it is the mouth of the River Boma. This piece of coast, as well as the preceding, is very clean.

Point Majana and Baracoa Point, which lie nearly east and west, 2 miles distant from each other, form a bay, in the east part of which is the anchorage of Playa de Miel, (Molasses Beach,) and in the west, the mouth of the Port of Baracoa; in the middle, between these two anchorages, is the town of Baracoa, standing on the S. E. point of the harbor of the same name. In this town dwell the pilots for the Bahama, or Old Channel; and therefore vessels which have not previously engaged one at the Aguadilla, in Porto Rico, come here for one.

The anchorage of Playa de Miel is very open to the norths. To anchor in it, you have only to approach Point Majana, and anchor something to the south of it, in from 10 to 30 fathoms, on a sandy bottom, taking care not to get to the east of that point, where you would be immediately in 4, or even in less than 4 fathoms of water. The general object of coming to Baracoa being only to obtain a pilot, there is no necessity, in that case, to anchor; but approaching Point Majana, even within 2 cables' length, if you choose, fire a cannon or gun and a pilot will come off directly. As the Playa de Miel is entirely open to the norths, in the season of them, it is much exposed; and, therefore, any vessel under the necessity of anchoring, should steer at once for Baracoa, to the entrance of which there is no obstacle, as it is completely clean, having no danger but what may be seen; and consulting the plan of it, you may choose the spot to anchor in which best suits the draught of water of your vessel.

BARACOA HARBOR, though secure and sheltered, has the great inconvenience of presenting its mouth to the breeze, and a great swell consequently sets in; and, being able to get out of it with the land breeze only, vessels are often detained much time in it during the norths, when the land breeze is not frequent; but in the rainy season you may almost reckon on having it every night. The Anvil Hill of Baracoa, (El Yunque de Baracoa,) which is a little mountain about 5 miles to the westward of the harbor, is an excellent mark to recognize it by, as, in clear days, it may be discovered at a distance of more than 12 leagues, and appears, over the other high land, like the flat top of an anvil.

From the Harbor of Baracoa the coast trends almost true north, 3 miles, to Point Canas, which, although very clean, ought not to be approached, because, being completely open to the breeze, there is always a heavy swell setting upon it. From Point Canas to the Harbor Maravi is 2 miles; the coast trends nearly west, and is very clean,

PORT MARAVI, though small, is well sheltered from the norths. Its entrance is not difficult, for you have only to keep in mid-channel, which is less than a cable's length in width, and running in for the middle of the bay, anchor as soon as an islet, which is on its western side, bears in the same direction.

From Maravis the coast trends nearly north, making a bend (or bight) to Point Van, and from thence it runs to the N. W., forming another bend to Port Navas, which is an opening of about 2 cables' length in extent, in all directions, with its mouth to the north; therefore, useful only as a shelter from the breezes. To enter it, no more is necessary than an inspection of the plan.*

From Port Navas to Port Cayaguaneque, the distance is only 2 short miles. Cayaguaneque is fit for very small vessels only, and its entrance is only 40 yards wide. The plan will give a perfect knowledge of it, and of the difficulties which present themselves in taking it.

TACO.—Three and a half miles from Cayaguaneque is the Harbor of Taco. It is well sheltered; but though, in its interior, there is depth for any class of vessels, yet its entrance has a bar with only from 13 to 18 feet on it, and it is also obstructed by rocky shoals with little water on them, which stretch out from both shores; but as, on account of the bar, vessels drawing only 10 or 12 feet water should go in, those will run no risk in running over the shoals, and therefore may take this harbor by keeping in mid-channel; and when once past the entrance, they may direct themselves to that part of the harbor which suits them best.

From the Harbor of Taco to Point Jaragua is 2½ miles; and the coast, which is a sandy beach, is clean. At Point Jaragua it ceases to be so, though all between it and Cape Maysi may be run along at a mile's distance. Point Jaragua sends out a reef which stretches to the N. W. of it; this point is the eastern one of the anchorage of the same name, which is only an opening in the reef, by which a vessel may enter upon the bank or shoal, and find shelter from the sea, behind the reef. The break or mouth is only two-thirds of a cable's length wide; and from it to some islets which are to the S. W. of it, the distance is two cables. The islets are three in number; the southern one is the largest; the anchorage for large vessels extends only till you are E. and W., true, with the south part of the middle islet; as farther in, there are only 12 to 18 feet of water. To take this anchorage it is necessary to sail outside the reef, which extends out from Point Jaragua, until the east part of the great islet bears nearly S. W., then steer directly for it; and if the vessel be large, anchor as soon as you are E. and W. with the middle islet, in 6 fathoms, on a sandy bottom: but if the vessel draws not more than 14 feet, you may run farther in, keeping, if you choose, within a quarter of a cable of the great islet, and about a cable's length from the middle of it, you may anchor in 19 feet, on clay. You may also enter the mouth without attending to the given markation of S. W., because the reef itself shows the opening. This harbor should never be taken, except in a case of necessity, as there can be no other motive for vessels coming to it.

From Point Jaragua the coast trends, first to the N. W., and afterwards to the north, forming a great bay to Point Guarico, which is 7 miles distant from the former. The reef which extends to Point Jaragua, rounds the whole of it, and stretches out about 2 miles from Point Guarico. In approaching this side of Cuba, be careful not to mistake Guarico Point for Cape Maize, it being dangerous at night and in thick weather, when you cannot recognize, and use as marks, the eastern lands of the island, and particularly when you are uncertain of your latitude.

From Point Guarico the coast trends nearly N. W., 8 miles, to the River Moa; it is all bordered by a reef, which extends about 2 miles out to sea. Almost N. by W. from the mouth of that river, and between the reef and the shore, is an islet, named Cayo Moa, which offers an excellent anchorage, sheltered from all sea. It is entered by an opening in the reef, almost due north from the mouth of the river. This opening is about 2 cables' length in width, and continues W. by S., forming the channel and anchorage, until the east part of Cayo Moa bears north. To take it, run along the east side of the reef until up with the opening, which will be when the eastern part of Cayo Moa bears W. by S.; and then steer S. W. until the south part of Cayo Moa bears W. N. W. ½ W.; then steer W. ½ S., and continue so till you anchor to the southward of the eastern part of Cayo Moa, in 6½ or 7 fathoms, upon clay. The plan of the port will give a perfect idea of this anchorage; for recognizing or finding which, some mountains about 4 leagues inland, named the Sierras de Moa, may serve as landmarks.

From the anchorage of Moa, the coast trends about west; it is all bounded by a reef, which extends 2 or 3 miles from it, as far as Port Yaguaneque, which is 11 miles distant from the former. On this part of the coast, and between it and the reef, are two keys, the eastern one named Burros, (Asses,) and the western Arena (Sand); these keys may

* The plans referred to in these directions, are those of the *Portulano de la America Setentrional*, published at Madrid, in 1809.

serve as marks for knowing this part of the coast. The Harbor of Yaguaneque is fit for small vessels only, because its bottom is shallow and unequal, and its entrance narrow and difficult to take, for the mouth is formed merely by a break in the reef. To take this port, it is necessary to follow the edge of the reef to windward, until you come to the opening, which lies N. W., two-thirds of a mile, from Arena Key; then steer to the southward, keeping along the edge of the weather-reef, because the lee-reef, which commences when you are west from Arena Key, narrows the entrance so much, that there is scarcely a cable's length of width in the channel. It is fit for small craft only.

CANANOVA.—A mile and a half from Yaguaneque is the Port of Cananova, which is properly an opening of the coast only, and must be entered by another opening through the reef.

Three miles to the westward of Cananova Harbor is that of Cebollas, which is alike most difficult to enter, or to get out of, and therefore unfit for large vessels.

TANAMO.—Ten miles west from Cebollas is Port Tanamo; and the intermediate coast is foul, with a reef which extends out about 2 miles from it. Tanamo is a large harbor, and fit for vessels of any denomination; to enter it, you must run along the edge of the windward reef until you find the opening in it; then steer S. ½ E. until you have passed the leeward point, when you may keep away up the elbow which the channel makes, in the middle of which you ought to keep; but no more is necessary than to give a berth of a third of a cable to all that is visible. With the plan and your eye, no farther directions are needful.

CABONICO AND LIVISA.—From Tanamo the coast trends west, 10 miles, to the entrance of the Harbors of Cabonico and Livisa; a reef extends also 2 miles from this piece of coast. These two harbors have one common entrance, which divides within into two branches; one to the eastward, leading to Cabonico, and the other to the westward, leading to Livisa. To enter these harbors you must go in by the opening in the reef, and then steer for the windward point until it bears S. ½ E., and then being near it, keep mid-channel, avoiding a reef which runs out from the windward shore, and which lies out about a cable's length from the interior point. You may approach within a third of a cable of the leeward shore; once abreast of the interior points, steer for the channel of the harbor you wish to take, without any other care than to keep mid-channel.

NIPE.—From these ports the coast continues foul, having a reef about W. N. W., 5 miles, to the Harbor of Nipe. This bay, for its magnitude and depth, is very extensive, and has a spacious entrance. The harbor is always accessible, for with either the breeze or the norths, you will run in with a free wind; coming out is quite the reverse, for this requires the land breezes, which, as we have said before, is often very rare in the season of the norths.

To distinguish this part of the coast, the mountains of Cristal may serve as marks: these are a continuation of the Cordillera, (or range,) which comes from Baracoa, and extends to the south from Port Livisa, at about 13 miles inland. The Pan of Sama, to the west, is also another excellent mark of recognizance; its figure being such that it cannot be mistaken, because the summit of it forms a table. It rises on the land to the north of Nipe and Banes, and is almost N. and S., true, with the Harbor of Sama; and as the mountains of Cristal terminate to the east, and the Pan of Sama, which begins to rise gradually, almost from Point Mulas, form an opening or break in the chain of hills or mountains, it is almost impossible for any one to mistake the place. The Pan of Sama may be seen 20 miles off.

BANES.—From the Harbor of Nipe the coast trends N. W., 11 miles, to the Port of Banes: it is all clean, and may be run along at half a mile's distance. The Harbor of Banes has its entrance in the middle of a bay formed by the coast, and which has 2½ miles of opening, whence it narrows into the entrance of the port, which is only a cable and a half in width, so that it resembles a funnel. The shores of both the bay and the channel are uncommonly clear and deep to, and you have to fear nothing but what is seen. Only thus could this port be entered with facility, as its entrance is so tortuous, and with such elbows and turnings, that you must alter your course, almost in an instant, from S. to N. It is excellent, as a place of shelter, for any class of vessels. It is extremely difficult, however, to get out of; because its mouth stands open to the trade wind, and it is necessary to avail yourself of the land breeze to get out clear, at any rate as far as the middle of the bay, that you may have room to tack and clear yourself from the rest of it, as well as of the coast, which there trends about N. by E., 10 miles, to Point Mulas, and which is foul, with a reef that stretches a mile from it.

POINT MULAS.—To enable any one to recognize Point Mulas, which, on account of its being very foul, and lying farther to the northward than any of the anteriór coast, may be very suspicious, the marks already given may suffice; these being the mountains of Cristal and Pan of Sama.

About 5 miles N. W. from Point Mulas is Point Lucretia, which is clear and high; the coast thence continues to the west, with some inclination to the south, for 13 miles,

to the Port of Sama, forming a bay named Rio Seco (Dry River). All this coast is very clear and scarped, excepting the bay, which has a beach.

THE PORT OF SAMA is fit for vessels only which do not draw more than 12 feet of water; and as the shores, both of its entrance and the interior, are very clean, the inspection of the plan will afford all the necessary instruction for taking it. You may know this part of the coast and harbor by the Pan of Sama, and a hill or mountain near its western part, which is pretty long, and lies N. W. and S. E., and the top of it seems to be plain and equal, and at its west end are scarped rocks which seem white, and where much honey is made. From this slope a sandy beach, named Gaurdalaboca, continues to the west: to the south of it may be seen a detatched hill, in the form of a sugar-loaf, and to the S. W. a small mountain covered with trees, the top of which forms a table, and which is named Mesata de Naranjo (Little Orange Table). Between the hill and the mountain is Port Naranjo, which is 5 miles distant from Sama.

PORT NARANJO is a good harbor for vessels of every class. Its windward point may easily be known by being high and scarped, while the rest is of beach. To take the harbor you must sail without the reef, until the windward point bears S. ½ E., when you may sail towards it, taking care to give it a cable's length berth, to keep clear of a shoal which surrounds it, and stretches out about two-thirds of a cable from it. It is also necessary to be cautious of another shoal, which stretches out from the leeward coast, and which sallies out to the north of the exterior sloping point, about one cable and one-third. What ought to be done is, to run in mid-channel until you are past the two points of the entrance; and so soon as you are well past that to windward, you may luff up, and anchor in a bight formed by the east coast, at about two-thirds of a cable from it, and in 10 fathoms water, opposite the spot where the mangroves come down so as to be bathed with the water.

This harbor has the peculiar advantage that a vessel may sail either in or out with the breeze.

From Port Naranjo the coast, which is a foul beach, trends W., 2½ miles, to Point Presquera Nuevo, which is sloping and clean; thence it descends W. S. W., 3 miles, to Port Vita, and is very clean. This little port is very good for vessels which do not draw more than 18 feet, and the inspection of the chart of it will be a sufficient guide. Three miles to the west of Vita is another small harbor, named Bariay, at the mouth of which there is shelter from the breezes, but only in the interior from the norths. Very small vessels only can get up there. The coast between Vita and Bariay is very clean. A mile to leeward of Bariay there is another port named Jururu, the entrance to which is very difficult, being very narrow; and although vessels drawing 20 feet may enter it, only small vessels ought to do so.

GIBARA, OR XIBERA.—Five miles west from Jururu is the Harbor of Gibara. Its entrance is 5 cables in breadth, and completely open to the north. The coast between it and Jururu is very clean. To find the port, three hills, or mounts, which are to be seen to the south of it, and which, at a great distance appear to be islands, are excellent marks. The first and most easterly of these is named Silla de Gibara (Saddle of Gibara): the middle one resembles the shape of a sugar boiler; and to the west of the third are some hills of a regular height.

From Port Gibara the coast, which is clean and sloping, trends to the north, 2 miles, to Point Brava, from which follows N. W. 10 miles of the same kind of coast, to Punta Mangle, (Mangrove Point,) and from it continues 6 miles in the same direction, but it is a sandy beach, and clean. From this point it trends west, but is foul, with a reef of 6 miles, to Puerto del Padre. All this land is low, and on the coast may be seen some small palm trees, called Miraguanas. At the west side of Port Padre there are two little mounds, very close together.

PUERTO DEL PADRE.—The harbor of Padre is excellent, and fit for any class and number of vessels. Its entrance is long, and only 2 cables in width; its shores are very clean, and have deep water. To enter this harbor it is necessary to navigate outside the reefs, until the east point, named Jarro, bears S. by E. ½ E., when you may place the prow to the outer leeward point of the entrance channel; and it is necessary not to confound this point with another, which is to the N. E., upon the same coast, and which, for distinction, is named Guinchos. The last has an islet of the same name very close to it, and it may assist much in finding the mouth of this harbor. Running for the before mentioned point to leeward, and then close past the S. E. part of Guinchos, no more remains than to steer for the channel, without its being necessary to beware of any more than what is visible.

From Port Padre the coast follows to the west, 5 miles, to Point Piedras, or Rock Point. Here is the entrance of the great Bay of Malagueta, which is no more than a lagoon formed in the interior, in consequence of the land being low and wet. The coast then trends N. N. W., 5 miles, to the Point of Covarrubias, from which it trends W. N. W., 10 miles, to the Harbor of Manati. All this coast is foul, with a reef which stretches out from it about 2 miles.

PUERTO DE MANATI.—The Harbor of Manati may be known by a mount, which may be discovered inland from it, shaped like a sugar loaf. It is called the Manueco, and may be seen at the distance of 15 or 20 miles. Close to the west of this may be seen another hill, not quite so high as it, which is called Fardo, or the Table of Manati, which, when seen in one, or shut in with the Manueco, looks like one hill, and presents to the view the appearance of the Saddle of Gibara, which appearance has deceived many, and is dangerous to navigation.

This Harbor of Manati may be considered as a lagoon, formed in low wet land, with a long, narrow, and crooked channel in it, and in which there is depth of water for small vessels only; as this channel, throughout its extent, is bordered with shoals of 6 and 8 feet of water, it is running much risk to enter it with middling sized vessels, and much more so with ships of war.

Three miles N. N. W. from Point Manati is Point Brava, which is foul, with a reef. The coast thence, which is also foul, with a reef, trends about west, for 5 miles, to the port of Nuevas Grandes (Great News). To enter this port, which is fit only for vessels of 12 feet draft, it is necessary to go in at a break in the reef; and the reef lies out 6 cables, or two-thirds of a mile from the coast, and follow in afterwards all that distance by a channel which the reef forms, and which in some places is only half a cable's length in breadth. This channel is very crooked, and therefore any one who is not well acquainted runs much risk. So soon as you are abreast of the points of the harbor, you may run along the coast at the distance of one-quarter of a cable, without any fear.

NUEVITAS DEL PRINCIPE.—From Nuevas Grandes the coast trends about N. W., 11 miles, to the Harbor of Nuevitas. It is all foul, with a reef, and may, as well as the harbor, be recognized by three mounts of short extent, which rise within the harbor. There are also three islets in the harbor, named the Ballanates. These seem high to the east, and diminish towards the west. Nuevitas Harbor is a large bay, with many shoals, but fit for any number and class of vessels. To enter it is necessary to avoid its windward or east point, to which you ought not to approach nearer than a cable's length, but approaching, if you choose, within half a cable's length of the leeward point; but the best way is to keep in the middle of the channel, which is very long and crooked.

From mid-length of the channel, going in, the coasts send out shoals, to keep clear of which requires good practice, which practice is equally necessary in the interior of the bay.

From Nuevitas the coast trends about N. N. W. to the Point of Maternillos, and is very clean. From Point Maternillos it trends about W. N. W., and is bordered with a reef which stretches out a mile and a half. All the coast from Maternillos rises a little; and nearly at the end of it, and about 14 miles from Maternillos, there is a little mount, called that of Juan Danue, which forms a kind of table. At this point commences a great white shoal or bank, which extends far to the west, and upon which are many keys and reefs. Here we cease from describing the coast, as being of no use to navigation, and begin to describe the edge of the white ground or shoal, with islets and keys upon it.

About W. N. W. from the Point of Juan Danue, but almost joined to it, there is a little islet, and in the same direction, and at the distance of 6 miles, is the Island Guajaba. This island may be known by four little mounts, which lie almost in a line, east and west. The first three may readily be seen, but it is not so with the fourth, which being of less elevation than the third, remains hidden by it; but as you advance to the westward, it opens out, and the whole four may be perceived. At about 4 or 5 leagues beyond these hillocks appear, as it were, many islets, caused by the lower lands of the coast being invisible above the horizon.

KEY ROMANO, &c.—To the west from Guajaba, at the distance of 8 miles, lies Key Romano, an island stretching N. W. and S. E., in which direction it is 16 leagues in extent. This land properly consists of two islands, separated by a channel half a mile wide. The eastern isle has some heights, which, in the middle of it, form a kind of saddle. The western isle is of low wet mangrove land. Key Romano lies considerably within the white grounds, and two small keys, called Key Verde and Key Confites, lie nearly N. $\frac{1}{2}$ W. from its easternmost height; the first at the distance of 7, and the second at 12 miles. Key Verde lies N. W. $\frac{1}{2}$ W. from the west part of Guajaba, and Key Confites N. W. by N. Between these two keys is an anchorage, which may be taken in case of necessity.

The Key Verde, or Green Key, lies $4\frac{3}{4}$ miles S. by E. from Key Confites, and a reef extends from it northward, to the distance of a mile and a half. From Key Confites a reef likewise extends to the southward one mile, and there is a clear passage of more than 2 miles within these reefs.

In order, therefore, to gain this anchorage, when coming from the eastward, you must stand in for the passage formed by these reefs, keeping a little nearer to Confites than to Key Verde; and when the middle of Confites bears due N. W. by N., and the middle of Key Verde S. by W., you will be on, or nearly on, the edge of the bank. Then lay the

ship's head, W. N. W., and stand on in this direction, until the southernmost part of Key Confites bears N., when you will stand N. N. W., or a little more to the northward. Having at length brought the south end of Confites N. N. E., half a mile distant, you may let go the anchor in 3½ or 4 fathoms, on sandy ground.

In getting under way from this anchorage, should the wind not allow you to stand to the S. E., you must bear away to the N. W. by N., until you have cleared a reef of rocks extending three-quarters of a mile to the N. W. from Confites Key; after which you may stand to the north, in order the sooner to gain the main channel.

West from Key Verde there is a round key, named Palomas, (pigeon's,) with various other small ones in its neighborhood. To the northward is the island named Key de Cruz, (Key of the Cross,) which is about 13 miles in extent, N. by W. and S. by E. To the N. E. of this isle, and at the distance of 3 miles, there is, on the very edge of the grounds, a shoal, named Tributario de Minerva, which lies N. 41° W. from Key Confites, at 12 miles distance.

The edge of the grounds, which is reef, stretches out a mile and a half from Juan Danue, 2½ miles from Guajaba, and from the E. N. E. to N. E., from the high part of Key Romano, forms an opening, by which, according to report, a vessel may enter, and anchor in 6 fathoms, upon sand, but good holding ground: but as we cannot guarantee this, any one who makes the attempt ought to exert great caution.

From this opening the reef rises again, but makes the opening already described between the Key Verde and Key Confites; and thence the edge of the ground continues, sometimes foul, and at others without reef, to the Tributario Shoal. This shoal breaks with a fresh breeze, and shows above the surface at low water. Six miles W. by N. from it is Key Baril, (Barrel Key,) and further to the west is Great Paredon Key. The edge of the grounds, which is sometimes foul and sometimes clean, lies out 2 miles from Key Baril, and one and a half mile from the north part of the Great Paredon. The latter key affords good anchorage, for either the time of breezes or land winds. To ascertain and take it, remember that, at a cable's length to the north of its north point, there is a small round key, which you ought to leave on the larboard hand when going in, and passing within from half a cable to a cable's length from it. You anchor soon as you are sheltered from the land of the Great Paredon, in the depth of water that suits the vessel's draft. On entering you will leave to starboard another key, rather larger than the one you leave to larboard: it is called the Middle Paredon, and lies about 2½ miles from the first.

From the Middle Paredon to the west, there is another large key, called Coco, from the middle of which to the west end there is anchorage on its north side.

To the west of Coco follow the groups of trees called St. Philip's Guilermos, and Santa Maria's. To the west of these, and at the distance of 16 leagues from Coco Key, lies that called Key Frances, which may be known from its having three round mounts, two of them very close together, and the third separate. These are named Tetas de Viuda (Widow's Paps.) Westward from this key is another portion of keys, one of which cannot be distinguished from another without difficulty, as they are so much alike.

The edge of the grounds from Key Frances, and even something before that, is clean, and the lead will there warn you before you are in any danger upon it. Nevertheless, there is considerable risk from the Baxo Nicolao, or Nicholas Shoal, which is a spot of sand, lying at a considerable distance to the northward of the other keys, and is 46 fathoms long, and 5 fathoms wide. It is surrounded by a reef to the N. E., N., and N. W., to the distance of a cable and a half. Two miles to the west from it another shoal breaks, which is named the Alcatraces, and as these shoals present great dangers to the navigator, it is necessary to give some marks to recognize them by, and which will indicate the position of a vessel in respect to the shoals.

Among other mountains which are on the land of Cuba, and about S. S. E. and S. from these shoals, the Sierra Morena (Black Mountain) is the best known. It is long, and lies N. W. and S. E. The S. E. head of it is moderately high, and upon its extremities are various points or peaks (pichanchos.) Of these peaks the two which are on the N. W. extremity of the sierra (mountain) are high, and lie N. and S., true, with Nicolao Shoal. A little more to the west of the Sierra Morena rises another mountain, with three heights on it, of which the middle one is the highest: it lies S. by W., true, from the Nicolao Shoal. These heights are named the Tetas de la Bella, (Belle's Paps,) and being N. and S., true, with the middle one of them, you will be also N. and S. with the Bay of Cadiz Key, and past both the Nicolao and Alcatraces Shoals.

To the west of the Tetas de la Bella, two mountains are seen. The first is of regular extent; the second, or westernmost, very long, and at the end of it are two hills, named Sierra de Limones, (Lime Mountain,) which runs S. by W., true, with the western extremity of the Bay of Cadiz Key. Farther to the west lies out another mountain, of proportioned extent, named Santa Clara; and something to the west of it may be seen the Paps of Camaricoa, of which there are four, though in some positions there do not appear to be so many. The middle one is the largest, and lies S. W. with the western-

most part of Key Cruz del Padre (Key of the Father's Cross.) These mountains are the highest which are on the north coast of Cuba; but it is to be remarked that those which are to the east and west of them are very equal to those of the west; indeed, are little less elevated than these mountains themselves. Such are the lands that are seen in the interior of the island, from the proximities of the Nicolao Shoal.

The White Ground still trends to the west. There are many keys upon the edge or border of it, and the edge is dangerous, having some reefs on it. The ground and keys terminate at Point Jacos. The keys named Mono, Piedras, and Monillo, are the westernmost on the reef. These afford good anchorage, where shelter from the swell of the norths may be found.

THE YCACOS KEYS.—The north-eastward of Port Ycacos, at the distance of about a mile from the edge of the bank, lie the three islets called by the Spaniards Cayo Mono.

PIEDRAS AND MONILLO.—These keys afford convenient anchorage to vessels which cannot advantageously use the Harbor of Matanzas. The southernmost and smallest is the Monillo, which lies at the distance of 3 miles from Point Ycacos. From Monillo to the Cayo de Piedras, (Rocky Key,) the distance is only half a mile, and from the latter to Mono Key it is 2 miles. At a mile and a quarter N. E. by N. from Mono there is a dangerous reef.

The anchorage, in regular soundings, of 5 to 7 fathoms, bottom of sand, is to the southward of Mono, and on the east and south of Piedras, where ships may lie defended from any sea, coming from the northward. The ground is sandy and clean, with from 5 to 6 fathoms, and vessels here may at all times get under sail. To take the anchorage so soon as you discover the keys, stand for the middle of either passage, and let go the anchor at pleasure. It is only necessary that in approaching from the N. E. you must take care to avoid the reef above mentioned, lying to the north-eastward of Mono.

MATANZAS.—From Point Ycacos the coast trends to the S. W. and W. S. W., 14 miles, to the Point of Maya, which is the eastern point of the great Bay of Matanzas. You may run along this coast at the distance of a league. The Pan of Matanzas, which distinguishes the bay, appears from this direction like an insulated mountain, having a round surface, and without peaks, water-courses, precipices, or other inequalities, excepting a small fissure near the S. E. part of the summit, which can hardly be noticed at a distance, being of so little depth. When bearing from S. S. W. to S., it appears like one round hill; but on any other bearing, another appears on each side of it, adjoining, and not so high. The land to the eastward is even, though not very low; but it begins to rise at Matanzas with a gradual slope, and to the west the coast may be seen at the distance of 8 leagues, but it is alike even or level, without any remarkable height, other than the pan, which appears over it.

The Harbor of Matanzas, which is at the bottom of the bay, is well sheltered from the norths, but it has several reefs. The Derrotero says it is difficult to get out of this place; for, as there is not room to beat out, it is necessary to get clear of it with the land breeze, which, during the season of the norths, occurs but seldom. The harbor is of easy entrance, but it is necessary to avoid some shoals which lie almost in the very anchorage. To accomplish this, it is advisable to keep along the leeward coast, at the distance of two or three cables' length, passing Point Maya at the distance of a mile and a half, while it bears to the southward. With the vessel's head nearly south, you pass the western shore at the distance above mentioned; and so soon as you see the Castle of St. Severino bearing W. ½ S., steer in that direction, until the houses, which will be seen in the S. W. corner of the bay, bear S. 35° W., when you must steer towards them, and anchor so soon as the Castle of St. Severino bears between N. W. ½ W. and N. W. ½ N., where you will have 5 or 6 fathoms of water, on loose clay or ooze.

To get out of this harbor, it is best to clear yourself by towing, or by the aid of the land breeze, if you have any, at a time when you consider the weather as settled, and there is no appearance of norths coming on. If agreeable, you may cross over, and come to an anchor on the bank or shoal point of Maya, which will be a proper situation to make sail from, when convenient.

Remarks on the Harbor of Matanzas, by Mr. Bellamy.—"This harbor is easy of access, and capable of holding a great number of shipping of different sizes, completely sheltered from all winds, except those from the N. E. quarter, which send in a heavy sea. The anchorage is partly protected on the N. E. by two shoals, named Baxo Nuevo, or New Shoal, and La Laja. On the shallowest part of the New Shoal, which is also the northernmost, is a buoy, with a pole and white flag, in 2 fathoms water; and on the southernmost (La Laja) is a pole with a white flag, in 2 feet: the principal entrance is between the two flags, and the channel is about 2 cables' length wide. These flags are very small, and at times cannot be seen at more than half a mile distant; and as they are badly fixed, very often break adrift. Therefore a stranger ought to pay strict attention to the leading mark, and keep a good lookout for the shallow water.

"The leading mark is the south side, or notch in the pan, on with a large white house,

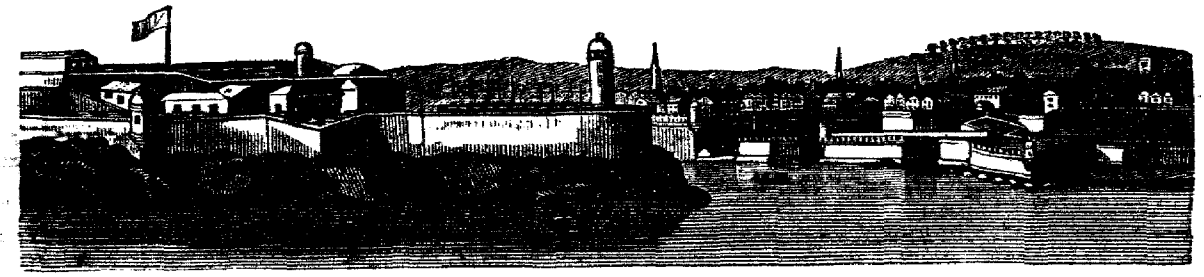
standing on a hill at the back of the town, and is the westernmost house visible, bearing W. S. W. ½ W., by compass. This mark will carry a vessel in mid-channel between the shoals; and when the Castle of St. Severino bears from N. W. ½ W. to N. W. ½ N., you may, if in a large ship, anchor in from 5 to 10 fathoms, and at the distance of a mile from the town. Small vessels may anchor farther up, within one-third of a mile from the town, according to their draft of water.

"There are also two other good channels into Matanzas; one between the New Shoal and the Castle of St. Severino, having 8 or 9 fathoms in it; and the other to the southward of the South Bank; but the middle channel is that preferred.

"The Spanish plan, in the Portulano de la America Setentrional, published at Madrid, in 1809, is very incorrect, with respect to both distance and soundings, and should not be relied on. The tides rise and fall at times between 2 and 3 feet; but they are influenced by the winds, and very irregular. It is not so difficult to get out of this place as has been described. During the 19 days that we lay here, the sea and land breezes were regular; and in the event of their not being so, vessels may beat out at almost any time, if acquainted with the place."

The Derrotero continues: From the Harbor of Matanzas the coast rounds to the N. W., to the Punta de Guanos, which is the most projecting point to the northward, and is distant from the mouth of the harbor or bay about 4 miles. From Point Guanos the coast runs almost (west) W. ½ N., a distance of 40 miles, to the Morro of the Havana: it is all clean and bold to, and may be run along at the distance of a league, or less, if required; inasmuch as there is no other risk than a rocky shoal, with little water on it, which stretches off from the coast, between the Rincon, or Corner, and the Punta de Tarara, or Cobre. Along this coast are soundings on sand, which extend more or less from shore, and of which the edges are steep and clear, so that you suddenly pass from 100 fathoms to 20. With the lead going there is no risk running along, because the soundings will warn you of the limits into which you stand without danger; and in good weather you may pass the night by dropping a kedge upon these soundings, which manœuvre may sometimes be convenient, either to avoid passing your port, if the wind blows fresh at night, or that you may not lose ground, if the land breeze is light or calm, as the current constantly runs eastward, at the mean rate of one mile per hour. The hills or mountains of Jaruco, which rise nearly in the middle of this coast, is a point which serves to recognize it by, and ascertain your situation.

HAVANA.—This, as noticed, is, in point of importance, the principal harbor of Cuba, and has been described as one of the best in the world, being deep enough for vessels of the largest class, sufficiently capacious to receive a thousand ships of war, and so safe that vessels ride securely without cable or anchor. The entrance is by a channel half a mile long, so narrow that only a single vessel can enter at once, and fortified through the whole distance with platforms, works, and artillery. The mouth of this channel is secured by two strong castles, as exhibited in the figure beneath. That on the eastern side, called Morro Castle, is built in the form of a triangle, fortified with bastions, and mounted with forty pieces of cannon, almost level with the water. On the opposite side of the channel is another strong fort, called the Punta Castle, connected with the castle town, on the north. The city is situated on the western side of the harbor, and is surrounded by ramparts, bastions, and ditches.



The Morro Castle, Light-house, and Entrance of Havana.

You may enter under the Morro Castle, situated on a high rock, on the south end of which is a light-house, containing reflecting lamps, which make a brilliant appearance, showing a revolving light, which may be seen 25 miles, past which the channel is so narrow, that you may nearly touch the side with a boat-hook. The top of the fort overtops the mast of the stoutest ship. After entering through this pass, you arrive at a second, only one hundred yards wide, on one side of which is the Punta Fort, (before mentioned,) and on the other, Castle Blanca, a prodigious strong fort, directly opposite the city; having passed these works, you enter a harbor almost unrivalled.

In passing the first castle, (Morro,) you must not come to anchor, as a reef lies off the starboard hand as you enter, which is dangerous.

It is stated that the entrance to the harbor of Havana is rapidly filling up. The channel by which three-deckers formerly entered will now barely permit forty-four gun ships to pass.

The Harbor of Havana may be distinguished at a distance by the Paps of Managua, which, as already stated, lie on the meridian of the entrance; while the land, both to the eastward and westward, is low and equal, with the exception only of the Morro, or little hill, surmounted by the fortifications and light-house. At 6 leagues to the eastward, the Hills of Jaruco, or Iron Hills, may be seen. These are of moderate height, and detached. The tables of Mariel are about 6 leagues to the westward; and in advancing, not only these, but the Hill of Cavanas, may at times be seen. [The form of the harbor can be best understood by reference to the particular plan of it, from the survey of Don Jose Del Rio, by whom the position of the Morro Castle has been determined and delineated on a chart, published by E. & G. W. BLUNT.] The entrance in lies nearly S. E. and N. W., and it is, therefore, very difficult to enter when the breeze is not to the northward of E. N. E. The breeze enters at about 10 h. A. M., and blows till sunset; and, therefore, it is only between these hours that you can sail into the port. It is very difficult, if not impossible, to sail in when the breeze is from E. N. E. to S. E., which it often is in the rainy season, and sometimes even in the dry season. Under such circumstances, the only resource is to anchor in the Morro Shoal, or Bank, and entering by towing or warping, when the breeze takes off, which, as already stated, is at night. As, on entering, these difficulties are to be encountered, so, on going out, you will not be quite free; for when the breeze comes to the N. E., which it often does in the dry season, or that of the norths, it is not only inconvenient, from the wind's being scant, but also because a swell sets into the mouth of the harbor, which renders this operation much exposed to danger. Generally speaking, it is best to enter about mid-day, and to go out at the dawn of day. Should the wind be scant for setting in, it is advisable to anchor outside the Morro, and tow or warp in at night.*

The Morro Bank affords anchorage safe enough in the time of the ordinary winds and land breezes, but is much exposed in the season of the norths, and in the hurricane months. It is, therefore, advisable to anchor so as to have the mouth of the harbor open, and to be extremely vigilant, lest you should be surprised. To direct yourself into the harbor, the eye may suffice, for in the channel there is no other danger than the shallows, which stretch out from each side. That on the Morro side does not extend one-third of a cable from the shore. To avoid the leeward shoal, it is requisite not to go farther from the eastern shore than a cable's length; working your vessel so as to run along half a cable's length from the coast on the N. E. side, the mid-channel being at about three-quarters of a cable's length. When once abreast of the middle of Castle Blanca on the N. E., which will be when you are abreast of the N. E. or front side of the city, you may keep away, and anchor opposite to the eastern part of the city, at what distance you choose. The largest ships may approach near enough to lay a plank on shore.

At a short distance without the Morro Castle, to the S. W., is a very small shoal, with 5 fathoms over it. This bank is to be feared only when there is much swell on; and at other times the largest ships may pass over it without touching. Even when the water begins to shoalen, you need not be afraid of it, as at half a cable's length from the Morro, you will be perfectly clear of it. Finally, if you wish to pass in without any risk, send a boat to place herself on the Capstan Shoal,† which will serve you for a mark; then steer so as to pass outside of her, and you will be free from all danger.

A respectable English navigator, in giving directions for the Havana, has said, "On going in, with the wind from the eastward, keep as close to the Morro as possible. So soon as you are within it, you may meet with flaws and variable winds; and should you be obliged to let go an anchor, great care should be taken to shorten sail and veer cable quickly, as the ground at the entrance of the harbor is not very good for holding. All ships lying in the channel of the lagoon, moor head and stern. There are two wrecks lying rather more than 2 cables' length within the entrance of the harbor, and denoted by buoys with small flags; the channel lies between them."

Ships of war and large merchant vessels, generally warp up the harbor, and anchor off the sheers or arsenal, where there is sufficient room for a great number of ships to moor, in from 7 to 5 fathoms.

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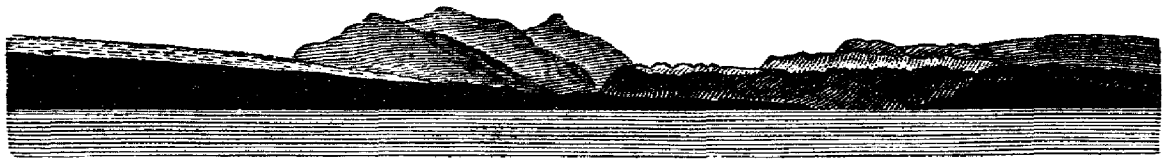
* In approaching the Havana from the eastward, care must be taken to avoid a shoal spot, more than a quarter of a mile from shore, and on which the ship Mariner, of Port Glasgow, grounded in 1815. The vessel drew about 17 feet of water; and from the shoal the Morro Castle bore about S. S. W., distant one mile. This notice is given from the information of Mr. Cooper, who was mate of the ship Jane, of Glasgow, then in company with the Mariner.

† The Capstan is the projecting edge of the shelf within the Morro, at about a cable's length from the light-house. A similar projection farther in, on the same side, is the Pastora or Shepherdess.

From the Morro, or Castle of Havana, to Punta de Ycacos, (or Yacos,) the distance is twenty leagues, and the course nearly E. ¾ N. From this point may be seen the Loaf or Pan of Matanzas, to the W. S. W. This hill, which is the northernmost that you will descry to the eastward of the Havana, lies over the Bay of Matanzas, and constitutes the grand point of departure for ships bound hence to the northward, through the Strait of Florida.



Pan of Matanzas to the E. S. E.

ISLAND OF CUBA.

We now commence with the south coast of Cuba from Cape Maize, proceeding regularly westward to Cape Antonio, including the Isle of Pines, &c. From Cape Antonio we continue to describe the coast eastward along the north side to Havana.

The greater portion of the coasts of Cuba, are extremely foul. Those most clear are the southern coasts, from Cape Maize to Cape Cruz, the N. E. coast from Cape Maize to Punta [Point] Maternillo, and the N. W. coast, from the Port of Mariel to Matanzas. On the other parts are many shallows, keys, and reefs, so thickly planted and so numerous, that in many places they form barriers, which prevent access to the coast of the island.

The land to the south-westward of Cape Maize, at about half a mile from it, begins to be high and clean, and it trends about S. W. ½ W., 6½ miles, forming a small bay, with a sandy beach, named Cala de Ovarado. From this Cala or cove, the shore trends about S. S. W., 4 miles, to Punta Negra, or Point Negra, whence it winds more to the W. S. W., about 4 miles more, to Punta Caleta; 28 miles W. ½ S. from which, lies Point Savana-la-Mar, and 4 miles to the westward from the latter, is the Port of Baitiqueri.

The 'Derrotero' says that, "From Cape Maize to Point Negra, the shore ought not to be approached nearer than two leagues; for, as there is no inducement to approach it, surely it would be foolish to run in upon a coast which lies completely open to the breezes, and along which there is no anchorage, although it is clear, and has no unseen danger. From Point Negra to Baitiquera, there is no risk in running along shore, at the distance of a mile; and along this part, and to the leeward of the various points thereon, you may anchor in the depth of water which suits you, from 35 to 7 fathoms; but the best bottom is in 16 fathoms, where you will be at a good distance off shore. In this place, several rivers discharge, from which you may provide yourself with excellent water, and plenty of firewood may be procured."

The Cape Bueno, or Ocoa Point of the English charts, lies to the eastward of the Punta de la Caletas of the Spanish: and it has been said by a British navigator, "Within this cape is the Bay of Ocoa, in which there is anchorage. The marks for anchoring are, the easternmost point bearing E. S. E., about one mile and a half, when the Table Land of St. Nicholas' Mole will be in a line with the point. You may anchor in any water, the depths being from 35 to 7 fathoms, but 16 and 18 are the best; and plenty of fish may be caught with hook and line. Two fresh water rivulets run into this bay, the one named Rio du Miel, or Honey River, lying 2 or 3 miles to the westward of the anchorage; the other, which lies nearer, is to the eastward, and at the bottom of the easternmost gully, but it is generally dry, from the unfrequency of rain."

The Harbor of Baitiqueri, already mentioned, is very small, and has a very narrow entrance: it has only from 15 to 20 feet of water, and therefore, is fit for small vessels only; it is well sheltered from all winds, and the rivulet of the same name, which runs into the interior of the harbor, affords an opportunity of watering. There is rather more than a cable's length between the two other points of the entrance; but a rocky reef, with from 10 to 17 feet on the edge of it, runs out from the windward point; and there is, also, a reef running out about a quarter of a cable from the leeward point. Between these two reefs lies the entrance channel, which is only 50 yards wide, and continues thus narrow for about a cable's length, after which it widens as you approach the two interior points; and the depth of the water admits of approaching the shore.

From Baitiqueri the coast trends about W. S. W., true, for 5 miles, to Point Tortuguilla, from which it follows W., true, 3 miles, to the river Yateras; S. W. 4 miles is Point Mal-Ano; and at 3 miles west from the latter, lies Puerto Escondido, (Hidden

Port.) All the coast between Baitiqueri and Port Escondido is clean, and may be safely sailed along at the distance of a mile.

Port Escondido forms an anchorage sheltered from all winds: in the interior of it are various bays, fit for all classes of vessels, but its entrance is very narrow, for between the outer points there is only one cable's length; and as each of them sends out a reef, of which the windward one lies out a third of a cable, the channel is only 90 yards wide; it, however, luckily has no windings, and the whole length of the strait is not more than a cable and a half; and as to enter it, you must steer N. 43° W.; it may always be done with a free wind, even if the breeze is at N. E. The most prudent mode of entering this harbor, is to order a boat to be placed on the outer point of the windward reef, which is nearly in mid-length of the channel, and which will serve as a mark to sail in by. You have then only to bring the vessel's head in the direction above given, and run on in that direction, passing close to the boat, until you have passed the inner point to leeward, where you may anchor in 5 or 6½ fathoms, clay ground.

As there is no town on this harbor, nor any proper leading marks for running in, it is proper to allow the vessel sufficient room to alter her course from windward to N. 43° W., the course for entering the harbor. We therefore recommend, although the windward coast of the entrance may be passed at half a cable's length, that it should not be passed at less than 3 or 4; because thus, although in luffing to, the vessel may pass the demarkation given, (N. 43° W.,) yet there will be room to rectify this, by luffing to windward before you are between the points, so as to gain the proper bearing, which is absolutely necessary, as the channel cannot otherwise be passed without danger. Any one wishing to run farther up the harbor, instead of bringing to in the anchorages we have mentioned, may easily do so by the eye, by towing, or even under sail; but for this it is necessary to consult a plan of the harbor.

Puerto Escondido* having no commerce, it is seldom that any vessel is bound into it: and if in any storm or hurricane, one is obliged to seek anchorage, we would rather advise every exertion to be made in order to reach the next harbor to the west, named Guantanamo; because, if it be difficult to enter Port Escondido in good weather, it must be much more so in storms and obscure weather; and it will be by no means strange if, without a pilot, or even with one, a vessel might be driven on one of the reefs of the entrance; or, what is still worse, might get on the rocks at some point of the coast, which might be mistaken for the entrance of this harbor.

GUANTANAMO, or CUMBERLAND HARBOR, a very extensive and excellent harbor, lies more than 24 leagues to the westward of Cape Maize, and 4 leagues from Puerto Escondido. The coast, in the latter distance, forms some very small sandy coves, and it is very clean. The entrance of Guantanamo, between the two outer points, is more than a mile broad. The Derrotero says—"The east point may be approached without fear, as there is no danger but what is visible. The coast trends nearly north, about a mile and a quarter, whence it changes to the N. E. to form the harbor. On the windward side of the entrance, and at about three-quarters of a mile within the outer point, a rocky shoal stretches from the shore, upon the edge of which are from 4 to 5 fathoms of water; this shoal is rather more than a cable's length broad, and may be easily avoided by attending to the subsequent directions. On the western side there is also a reef of rocks, but it is narrower than that on the east. To enter this harbor, it is necessary only to place your vessel so as to pass its windward point at the distance of one or two cables' length, and thence luff up to N. W. by N., on which course you must continue until the north point of the River Guantanamo, or Augusta River, bears west; you may then change your course to N. by W., until you have the interior point of the windward shore bearing east, when you will be clear of the reef which stretches from it. You may next haul by the wind, and anchor where it may suit you best; or, if you wish to run into the interior of the harbor, and the breeze will not allow you to lay through, you may beat in with the assistance of the lead only."

The following remarks on the Harbor of Guantanamo, were made by on officer on the Jamaica station, in 1809:

"The appearance of a remarkable spot of land, on the side of a hill, at a distance in-shore, determines the situation of Cumberland Harbor, which, if you fall in to the westward, exactly resembles a kite, and is totally open when it bears N. E. ¼ E.; but if you are far to the southward, it will either be partly or entirely hid, unless you are far enough to the westward to bring it over the hills on that side of it."

The following directions for sailing in, have been given by Mr. J. Town, from observations made by him in 1817:

"On coming in, you will observe, in the middle of the bay, a remarkable light yellow (or brown and white) cliff; bring this cliff to bear about N. by W. or N. by W. ½ W., and run in with that bearing until you open, on the eastern side, a small sandy point,

* Puerto Escondido, or Hidden Port, is well termed so, as I have been within less than a mile of the entrance of it, and could not make it out distinctly.—A. L.

with two huts on it. This point, called Fisherman's Point, cannot be mistaken, as there is no other sandy point on the east side of the harbor. After you have opened Fisherman's Point, with the bearing above described, you may steer N. N. E., and when Fisherman's Point bears E. by S., haul up N. E. or N. E. by E., and anchor in 6 or 7 fathoms, muddy bottom. The best marks for anchoring are, Fisherman's Point S. by E. or S. S. E., the west head of the harbor S. W. ½ W., and the light yellow cliff W. ½ S., in 7 fathoms.

"On coming in from the eastward, you may keep in as near to the east head of the entrance as you please, there being 10 fathoms close to it; after passing, run to the westward, and bring the aforementioned bearings on, which will clear the reef that lies off the point, a little to the S. W. of Fisherman's Point. The marks for the south end of this reef, which has heretofore been described as a single rock, are, the two huts on Fisherman's Point on with each other, bearing N. E. by E., and the point within the East Head S. by E., West Head S. W. by W. ½ W., entrance of Augusta River W. ½ S., the yellow cliff N. W. by N. The marks for the north end of the reef are, the N. E. hut about its breadth open to the northward of the S. W. hut, bearing N. E. by E. ¾ E., the point within the East Head S. ½ E., the entrance of Augusta River W. S. W. The reef lies N. by W. and S. by E. about 1½ cable's length, and 50 fathoms in breadth. It has 17 feet water on its shoalest part, 3½ fathoms within it, and 5 fathoms close to the outer edge, which is about 2½ cables' length from the shore.

"On coming in from the westward, you may approach the point to a cable's length, as it is steep to; but, from the appearance of the point at a distance, a stranger would suppose there was a reef extending from it; at least, when you are within a quarter of a mile. After you are within this point, haul more to the eastward, as there is a flat that extends from the entrance of Augusta River, in a straight direction for the yellow cliff; this flat extends nearly one third of the distance across the harbor towards Fisherman's Point; but the soundings to and along it are very regular.

"If the wind is off the land, and you have to work in, your lead will be the best pilot when standing to the westward; but in standing to the eastward, be careful, and do not approach the land nearer than three cables' length, as the reef already described is steep to.

"In running in, with the marks described, you will be within the points before you get soundings: after which the soundings are very regular, from 18 to 6 fathoms.

Augusta River is narrow at the entrance, and has only 12 or 14 feet water at about one quarter of a mile up. You may go up the river by keeping the starboard shore on board, or go into a large lagoon on the larboard side.

When the entrance of the harbor bears nearly north, 5 or 6 miles distant, the land to the westward of the harbor and the Morro Castle of St. Jago de Cuba will be in a line, bearing W. ½ N., and the outermost land to the eastward E. N. E.

From Guantanamo to Point Berracos, the coast trends nearly true west, 26 miles; it is generally clean, and you may run along it at a mile from the shore. Point Berracos may be known by a morro or hill which rises on it. From this point the coast bends to the north-westward, and forms the Bay of Cabo Baxa, (Low Cape,) whence it trends west to the River Iuragua. The space between Cape Baxa and Iuragua is named los Altares, or the Altars, because the coast forms three beachy bays, separated from each other by high scarped mounts. The River Iuragua is 10 miles distant from Point Berracos.

From the River Iuragua the coast continues nearly west, 12 miles, to the entrance of the Port of St. Jago de Cuba; it is all clean, and may be run along at the distance of a mile. The Rivers De Sardinero and De Aquadores disembogue upon it; and near this last may be seen some small houses, inhabited by water-carriers.

The HARBOR of St. JAGO DE CUBA is very good; but the entrance being narrow and crooked, is difficult to take. On the east point stands the Morro Castle, and a little farther in Estrella (Star) Castle, which is separated from the Morro by a bay, at the end of which is another small fort or battery. A rocky shoal runs out from the windward coast, which extends out about 2½ cables' length from the Morro Point; and, on the leeward side, another shoal runs out, about a cable's length south of the point. The channel lies between these two shoals. At its entrance is a cable's length in width, and farther in, is reduced by about a third of a cable; so that, when abreast of the bay, which is between the Morro and Estrella Castles, which is the narrowest part, it is only two-thirds of a cable in width; and from this it continues, with the same width, until you pass Cape Smith, when the harbor begins to open.

To take this port you ought to sail half a league or two miles off the shore, until the Estrella Castle bears N. E., when, placing the vessel's prow in that direction, and steering the same course, you will enter the channel formed by the reefs; but, so soon as you are abreast of the Morro Point, within a quarter of a cable's length of which you may pass, you may begin to keep away; so that, when up with the battery, which is at the bottom of the bay, between the Morro and Estrella Castles, the vessel's head shall be N. ½ W., which course it is necessary to follow until you are past Cape Smith, when you may anchor.

The necessity you are under (from the crookedness of the entrance) of keeping away four points, viz. from N. E. to N., renders it almost needful that a large vessel should have sufficient space to make the turn in. To this end we advise that, so soon as you are abreast of the Morro Point, you ought to begin to keep away; for without this, you may very easily get ashore at the Estrella Castle. It must here be remarked, that it would be improper to keep the vessel's prow away to the north at once, though it may sometimes be done under favorable circumstances; for, by doing this, you incur a risk of getting ashore on the corner of the leeward reef.

The distance between the Morro Point and abreast of the battery, at the bottom of the bay, on the east, is one cable's length; with the knowledge of this, the pilot will know to regulate the steerage, and trim the sails, &c., as may be necessary to gain his purpose, and according to the facility with which the vessel can be worked.

At the bottom of this harbor, on the N. E., is the city of St. Jago, or of Cuba, which is the most ancient city in the island.

From St. Jago de Cuba, the coast continues to the west, forming various bays, with anchorages of little importance, the knowledge of which is alone useful to coasters. Upon this coast are the high Copper Mountains, (Sierras del Cobre,) which are about 11 miles distant from St. Jago. In clear weather these mountains have been seen 33 leagues off.

Forty miles W. by S. from St. Jago de Cuba rises another very high mountain, named the Peak of Tarquina, which is an excellent landmark. Cape Cruz is the last place on this part of the island where the coast is clean. It lies more than 30 leagues from St. Jago, and you may run along the whole intermediate coast at the distance of a league, or even less; but, as there is no motive to induce one to approximate it so much, it seems more advisable for those bound to the westward, to run along at 2 or 3 leagues distance from the shore. At Cape de Cruz commences a white bank, which extends 60 leagues to the north-westward, and terminates at Trinidad. Upon this bank are keys and reefs without number, which form channels of more or less width. Of the keys on the edge of the bank, the principal are those called the Cayos de las Doce Leguas, or the Twelve-league Keys, the whole range of which extend not less than 20 leagues in a W. N. W. direction.

To coast along the Doce Leguas Keys, and being 3 miles to the southward of Cape de Cruz, steer W. N. W. ¾ W., with which course you will run along the edge of the bank; and, having run 12½ miles in this direction, alter your course to N. W. ¼ N., with which you will enter upon the bank in 40 fathoms, on sand and rocks; keep this course for 23 miles, when, with the edge in sight, you will leave it in nearly 50 fathoms. Continuing the same course 17 miles more, you will again find 40 fathoms, or less, and soon afterwards will see Livisa Key to the N. N. E., and ahead will be seen the eastern head of the Doce Leguas Keys.

Having recognized these two points, you must run along on the bank, but without getting along into less than 4 fathoms, until you find yourself 3 miles to the south of the eastern head, and in 7 fathoms water, over a bottom of sand; you must then run W. by N. With this course you will shortly run off the bank, and may coast along the Doce Leguas Keys, at the distance of a league, without any fear; and having run 21½ miles, steer W. N. W. 18½ miles, and you will then have the Boca de Caballones (or mouth of the Caballones Channel) open; and it may be easily known, as it is broader than any other to the eastward, and because the S. and E. point of its entrance is very low, and the edges at the water of Soboruco Rock.

Having ascertained your situation from seeing this Boca or Channel, you may continue coasting along the keys, at the distance of three miles, continuing on the preceding course; and having run 21 miles, you will see to the northward a great opening formed by the keys, which is the Boca Grande; passing by it, pursue the same course, keeping the Cinco Balas, or Five Balls' Keys, in sight, at the distance of 2 leagues, and noting that a reef extends 3 miles to the S. W. of Key Breton. The latter is the westernmost of the Doce Leguas Keys, nearly in a line between Key Breton and Puerto Casilda. On the main of Cuba, is the Placer de la Paz, a sand-bank, having on its eastern part good anchorage, and no where less than 14 fathoms, on sand and shells.

ADMONITIONS.—If night comes on, when you are in the vicinity of Cape de Cruz, or to the south of it, as assumed in the preceding directions, you must steer W. ½ S., for 14 miles, and thence N. W. ¾ W., to keep completely free of the Doce Leguas Keys: continue this course till day-light, changing it afterwards so as to make and recognize these keys, and thus include yourself in the route already recommended.

Should night overtake you in the traverse between Cape de Cruz and the Eastern Head, when it might suit you to anchor on the bank, you may do so on any part of it, observing only that the edges of the banks are rocky, and that to get clean ground, you ought to run in upon it into 20, or even 10 fathoms, on sand.

If night falls when you are coasting along the Doce Leguas Keys, as already directed, steer true West until you consider yourself from 3 to 3½ leagues from them, and even

then continue the same course, considering that hereabout the current sets N. E. and S. W., and, if the tide happens to set in, it is very possible to get aground on the reef: hence no precaution ought to be omitted which similar cases require.

If, when in sight of the Canal de Caballones, you wish to anchor in its mouth, from a case of emergency, you can do so without getting into less than 3 fathoms, on sand; and, in case of being unable to continue your course to the south of the keys, you can shape your course so as to descry the land of Cuba, passing between the Bergantin and Manuel Gomez Keys, in 12 fathoms, on clay; following afterwards to the north, to make the Anna Maria Keys, and giving a berth to the shoal of Yagua, which you leave to larboard, and to some heads which are to the east of it, and which should be left to starboard. Having seen the last keys, and placed yourself about a league from them, you must steer for the coast; or act as directed in the instructions for this interior navigation.

MANZANILLA.—The reef, which extends two miles off Cape Cruz, can be passed within fifty yards, in 3 fathoms water. This reef is very steep. As soon as you have passed the reef, haul in for the land; you will then have 2½ fathoms water within one-half a mile of the beach. The first point from the cape is called Point Calrado; this cape lies N. E., 6 miles from Cape Cruz. The anchorage is good from the Cape to Manzanilla in the sloop channel. In passing Point Calrado, you will have 3 fathoms; as soon as you have passed the point, you will have from 8 to 10. This point should be passed within one-half a mile. Three-fourths of a mile from Point Calrado, in a N. W. direction, lies a shoal; it extends about 3 miles in the same direction. Six miles from Point Calrado, in a N. E. by E. direction, is Point Balona; this point has a shoal extending off from it, in a N. W. direction, 1½ mile. Three miles N. W. from Point Balona, lies what the Pilots call the Balona Shoal; the shoal extends N. W. 2½ miles. Three miles from Point Balona, in a N. E. direction, lies a small key, called by the Pilots, Mona Key; this key lies close to the main land, and cannot be seen as a key in passing along in the channel. The shoal water extends off this key about a mile. Two miles distant, in a N. W. direction, is what the Pilots call the Mona Shoal; between there are 6 fathoms. Back of the Mona Key is Lime River, being the first fresh water about the cape. N. by E., 7 miles, as estimated by the Pilots, lie two small keys, called by the Pilots Swago. N., 4 miles from Swago, lie a group of keys, trending E. by N. and W. by S., 4 miles, called Sloop-Channel Keys. There are two shoals lying W. by N. of the Swago Keys. From Sloop-Channel Keys the passage is clear to Manzanilla.

N. W. by W. 7 miles from Point Balona, commences the Great Bank, which extends 75 miles. Between this and the reef before mentioned, lies the main channel to Manzanilla.

A pilot can most always be found at Cape Cruz. There are but four pilots at Manzanilla, and in some cases a vessel might be detained for want of one.

The City of TRINIDAD, is situated in lat. 21° 42½′ long. 80° 4′. It lies on high ground, about three miles from the sea: the River Guanrabo, or of Trinidad, passes rather more than half a mile to the northward of it, and falls into the sea at a little to the south of it. Trinidad communicates with the sea by this river, from the mouth of which it is three short miles distant; by Puerto Casilda, from which it is distant two miles and a half; and by Puerto Masio, the distance from which is 4½ miles. The mouth of the River Guanrabo is to the north of the point of Maria Aguilar, at which the white grounds extending from Cape de Cruz terminate. The harbors of Casilda and Masio are to the eastward of this point, and to arrive at them a vessel must enter upon the white grounds.

Directions for sailing from Cape de Cruz to the neighborhood of these ports have already been given. We have only to repeat, that it is always advisable to keep a good look-out, and the lead going, especially by night. Having recognized Key Grande, continue the N. W. course until Key Breton bears N. E., bringing it the distance of 9 miles. From this spot a N. N. W. ½ W. course, 38 miles, will bring you to another, from which the Pan de Azucar, or Sugar-loaf Hill, will appear on with the most easterly of the hills of Bonao, which are some high ridges immediately to the westward of it. In this navigation the keys called the Zarza and Machos will be seen from without; and when the leading mark above given is on, you will still be in sight of the Machos, and of another very small key, named Puga; the latter is rendered remarkable by the breaking of the sea upon it, and it will bear about N. ½ W., a mile distant. From the same spot the Key Blanco will be seen, bearing about N. N. W. ½ W. This key is remarkable, both as the westernmost key on the bank, and because its shore is bordered with white rocks.

The place where you ought to enter upon the White Ground is between the Keys Puga and Blanco, to do which you must steer so as to pass about half a mile, or rather less, from the reef of Puga, which reef always shows; and in the passage you will always have 6 fathoms of water. Having passed Puga, you must steer N. ½ W., in order to anchor in 4 fathoms, sand and weed, with the south part of Key Blanco W. ½ S., that is, if the approach of night, or waiting for a pilot, render it necessary.

On the route between Key Grande and Key Blanco, no one need be at any loss, who has the particular chart of the navigation between the Rio Guanrabo and the Boca

Grande. By it may be seen that any one who wishes to enter upon the bank by the Boca Grande may always do so, provided his vessel does not draw more than 14 feet of water; and it may even sometimes be convenient to run in here to anchor, under the shelter of Key Grande or those of Cinco Balas, in case of bad weather coming on, which will frequently happen, and which is much to be feared in August, September, and October; or, if he does not choose to anchor in the shelter of those keys, he may run in until he recognizes the key called Rabi-horcado, which he will leave on the larboard hand, and will afterwards see Cayo Bargayo; having passed to the eastward of the latter, he may run N. N. W. without fear, being guided in running by the vessel's draught of water; and, entering by the Machos Channel, he may run for Masio or Puerto Casilda, as he sees proper.

The key called Blanco de Zarza lies N. by W., 8 miles from the Cayo Zarza de fuera, and half a league to the southward of Punta del Caney. Between this key and the coast there is anchorage, as there also is in various other places hereabout, which will be found more or less commodious, according to the winds and draft of the vessel. The keys, in general, are but little above the surface of the water, and their low shores have no extent of beach; but rocky banks stretch out to a short distance from their points; excepting, however, those which form the Machos Channel, which, within the strait, are very clean.

The Coast from the River Jatibonico, westward to Port Casilda, Trinidad, &c.

The coast between Point Jatibonico, and Point Passabanao, in a distance of two leagues, forms a bay with $2\frac{1}{2}$ and 3 fathoms. The shore is drowned and covered with mangroves. At Point Jatibonico the river of the same name enters the sea. To water in it, you must ascend the river for a league. Many cedar and mahogany trees are brought down this river, and many vessels take in cargoes here. Three miles to the west of Passabanao is the Estero de las Caovas, (Mahogany Creek,) in which small craft not drawing above 6 feet, may find shelter from the south-east winds. After Estera de las Caovas, at three miles, follows Point Manati, on which there are some wells of tolerable sweet water. Point Manati, with Point Tolete, which lies two leagues to the west of it, form a small bay, in the middle of which is the mouth of the Estero Nuevo, (New Creek.) Point Tolete and Point Zarza, $4\frac{1}{2}$ miles distant, form another bay, in which is the Estero de San Marcos, with very little water at its entrance. On the eastern part of Point Zarza, the river disembogues itself. By this river there is much traffic carried on with the town of Sancti Espiritu, which is 13 leagues inland. West of Zarza Point is the creek of the same name, with 7 feet water, where small vessels may find shelter from the south-easters, as they may also to the westward of Point Zarza, under the lee of a reef, which runs out from the W. S. W. of it for nearly a mile, and which forms a bay, with a clayey bottom, of 3 and $3\frac{1}{2}$ fathoms.

A league to the west of Point Zarza is Point Caney; between is a small bay, with 3 and 5 fathoms, clay and grass bottom. On the west of Point Caney is the estero, (creek,) the same name, with 7 feet of water. To the south of this point is Cayo Blanco de Zarza, (the White Key of Zarza,) and between the reef which runs out from it and the point there is a good channel, navigable for any vessel, which, as before said, may find good shelter to the west of the key. Beyond Point Caney, on the west, is the Desembarcadero de Mangle (Mangrove Mouth.) Two leagues west of Point Caney is Point Ciego; between is a bay with from 3 to 5 fathoms: in the middle of it is the River Tallabacoa, which has very little water in the dry season; and that of a brook, at a very short distance to the westward of Point Ciego, is always preferable. After Point Ciego comes that of Yguanojo, at which is the river of the same name, the water of which is excellent, but to procure it, it is necessary to ascend the river for a league. One league and a half west from Point Yguanojo is that of Agabama, to the eastward of which run out the Cayeos de Tierra, (Keys of the Land,) which, with Point Yguanojo, form a bay called St. Pedros, having from $3\frac{1}{2}$ to 6 fathoms, on clay.

The Cayeos de Tierra, with Point Agabama, form another small bay, having 7, 5, and 4 fathoms, on clay and sand. At Point Agabama is the river of the same name.

The shores from Agabama to Point Casilda are drowned, and covered with mangroves (literally, watery mangrove land;) and from Casilda to Point Guanrabo, they are of sand and scarped rock. Relative to the interior of the land, we shall only notice that the Potrelillo, which is the highest point of the mountains above Trinidad, may be seen in clear days at 21 leagues off, and the Sugar-loaf (Pan de Azucar) and it are excellent marks for accurately ascertaining your position.

From Boca Grande the reef forbids entering on the bank as far as the Outer Zarza, between which and the Outer Macos there is a spacious entrance, with depth for any vessels. Nevertheless, if when in sight of Key Breton, and to leeward of Boca Grande, you wish to anchor upon the bank, in order to regulate the time for making Puga and Cayo Blanco, or for any other course, it may be done by steering towards Key Breton, until the N. W. part of that key bears E. $\frac{3}{4}$ N.; but in running thus, sound frequently,

until you have from 4 to 3 fathoms, on sand, when you may anchor. If the wind will not allow you to steer in for the anchorage directly east, and you are obliged to beat to windward, observe not to prolong the tacks to the northward longer than until the N. W. part of the key bears E. S. E., or the south tack farther than until the same point of the key bears N. E. by E. Between these bearings you may work, tack and tack, till you reach the anchorage, in which there is a shelter from the winds from N. by E. to S. W., caused by the cordon of reefs and keys which lie in these directions. All these reefs show above water, and the outer part of them lies nearly 3 miles S. W. from the west part of Key Breton.

Any large vessel seeking shelter from the weather, or any other cause, upon the bank, may enter between the outer Zarza and outer Machos, and may run over the whole of the interior of the bank, there being sufficient depth for vessels of any class, and for this the chart is the best guide.

TIDES.—We shall now terminate this part of the subject by remarking, that the tides produce streams more or less rapid, and in various directions, according to the channels which the reefs form: but they are of very little importance, because the greatest rise of water, which is at the time of the new moon, is not more than a foot and a half, except with S. E. winds, when it sometimes rises 3 feet.

MASIO, PORT CASILDA, AND TRINIDAD.—To enter Port Masio, being within the bank, steer N. ¾ W., until the south part of Key Blanco bears W. ¾ S., in which situation you will find 4 fathoms, on clay and weeds, or grass (yerba.) From thence run N. 50° W., with which course you will run along the middle of the channel of Masio, which is formed by a shoal extending N. W. by W. from Key Blanco, and a shoal, with some heads nearly even with the water, on the land side; and you must continue thus till you have Point Jobabo N. ¾ W. This point may easily be known by a sandy beach. You must then luff up with the prow to the west point of the harbor; and steering N. N. W., take care to keep a very little away until you are past the Guardhouse Point, that you may keep clear of the reef which runs out from it. Being past this, keep the prow as above directed to the west point, until near the entrance, when you may run up the middle of it by the eye, because the edges of the shoals show distinctly, and the eye and lead are the best guides. Having run up the middle of the entrance, luff up N. by E. until, having passed the points, and being in 4 or 3½ fathoms, you may anchor where it suits you, being cautious solely of a clay bank which runs out from the landing place on the west shore, and the extremity of which is in one with the west point of the port, at south.

Passing in for Masio, you leave the Bay of Caballonas to the starboard; and if you wish to anchor in it, for shelter from the N. and S. E. winds, you may do so by keeping in the middle between the two points which form it, and directing yourself mid-strait, and with the prow N. E. by E., anchor when you are in 3½ fathoms, clay or ooze.

To enter Port Casilda, observe the same route as that given for Port Masio, until the south part of Key Guayo is on with the south part of the main land of Casilda, in which direction is the mouth or opening of Jobabo, by which you ought to enter, and keeping away in this position to run in the middle of it, the eye and lead will facilitate the entrance, which is 110 yards wide, with 4 fathoms of water. Being at the west of this opening, at a cable's distance, steer W. S. W., sailing in 6, 7, and 8 fathoms, clay, until you bring Point Casilda on with the north point of Cayo Ratones, at which moment place the prow to the westernmost part of the city of Trinidad, avoiding the reef, which runs out S. S. W. from Cayo Guayo, and which will be passed so soon as you bring the south part of this key on with the south part of Tabaco. Afterwards steer towards the easternmost part of the city, until you bring the south part of Key Ratones on with the westernmost part of the high hills of the Rio Honda, when you will steer towards these objects until you pass the shoal Eumedio; and following the same mark, with the precaution of keeping a little to starboard, you will pass clear of Point Casilda, which is rather foul; and passing on for the interior, go to the south of Key Ratones, giving a berth to the point of it; having passed which, you may steer N. W. ¾ W., and shortly afterwards anchor in 3 or 3½ fathoms, on clay.

You may anchor in any part of these channels, if circumstances require it, upon a clayey bottom. You may also take Port Casilda, entering from the channel of Agabama, by the north of Key Guayo, or from the west of Key Blanco, and by the breaks or mouths in this part of the reef, as Boca Grande, the Negrilla and Mulatas; but the entrances are dangerous, and there are no proper leading marks.

To enter the mouth of Guarnabo, or Trinidad River, steer outside the bank, and run in without fear, even within a musket shot of the shore, which in this place is very clean; and running on at the same distance, you will see the bay of the entrance, formed by the point of Ciriales to the south, and the point of the River Canas to the north; and when you have it well open, direct yourself (with little sail set) so as to pass nearer Point Canas than Point Ciriales, for it is much cleaner. Sound frequently, however, and, if in a large vessel, anchor immediately upon getting bottom, because the anchorage is of very

small extent. If the vessel is small, you may run in, steering towards the south shore of the bay, keeping the prow between two sandy beaches, which are the only ones on it; and when in 6 or 8 fathoms, sandy bottom, you may anchor.

Having now described this navigation, it is necessary only to add, that Masio is preferable to Casilda, not only on account of its deeper water, and that you can sail out of it with the trade wind, but that it is more easy to take, and does not require a pilot; while, on the contrary, Port Casilda cannot be entered without one. Its anchorage is not more than 4 cables' length in extent. It is very difficult to get out of it with the trade wind; and, finally, to obtain water, it is necessary to send boats to the River Guarabo. Port Masio is therefore the only one which vessels intending to load or discharge, or remain any time at Trinidad, ought to take.

From the River Guarabo the coast westward is very clean, and you may run along it at the distance of a league. For 8 long miles it trends W. $\frac{3}{4}$ N., as far as the west point of the River Honda; from this it continues N. W. by W. $\frac{3}{4}$ W., 9 miles, to the Point of San Juan, which is well marked, as the coast afterwards trends N. by W. $\frac{1}{4}$ W., for a long mile, to the River, Guagimico.

Between the River Guarabo and the Point of San Juan, the Rivers Guanayara, Cabagan, Honda, Yaguanabo, and St. Juan, run into the sea. In all these, coasting vessels, which do not draw more than 6 feet, sometimes anchor. To get fresh water in any of them, it is necessary to proceed a league up from their mouths.

Along this part of the coast the water is deep, and the bottom clean, excepting a little reef, which stretches out between the Rivers Yaguanabo and San Juan, and which does not extend from the coast so much as a half a mile. The shore is scarped, and of soboruco rock. The land is mountainous or hilly for a little to the west of San Juan's Point, and at it commences the mountains of San Juan, or of Trinidad.

From the River Guagimico the coast trends 14 miles N. W. by W. to the Colorados Point, which is the east point of Port Xagua, and is so clean that it may be run along at less than half a cable's length. The land is level, without mountains, and in it the rivers Gavilan, Gavilancito, and Arimao, are met with; but they are of little importance.

Within the Bay of Xagua, and on the north side, and between Point Gorda and Point Atunes, is the town of Fernandina, or Cienfuegos; there is good anchorage off the town, and between the above points. This town is increasing in commercial importance.

The Port or Harbor of Xagua, or Jagua, is very spacious, secure at all times, and has deep water, but its entrance is very narrow and crooked. The east point, named Colorados, and the west, Sabanilla, or de la Vigia, are the exterior points of this port, and the distance between them is a large mile. The windward shore, from Point Colorados, trends N. W. $\frac{1}{4}$ N., 2 miles, to Point Pasa Caballos, whence it sweeps to the N. by E., about two-thirds of a mile, to Point Milpa, which is the interior eastern point of the strait. The leeward shore of the entrance follows nearly the same direction as the windward, and narrows the channel so much, that opposite Point Pasa Caballos it is only a cable and a third in width, and thus it continues to Point Milpa.

To enter Port Xagua, pass Point Colorados at the fourth of a cable's length; but shun the exterior coast to windward, as a reef stretches from it, and it cannot be approached nearer than a mile: you run on, inward, preserving the same distance of a quarter of a cable, until you arrive at Point Pasa Caballos, when you must luff, for the purpose of keeping in mid-channel, or rather nearer to the leeward side; and so soon as abreast of the interior points, place the vessel's head towards the S. E. point of Cayo de Carenas, and proceed thus, in order to avoid a shoal which lies to the northward of Point Milpa, and of which you will be clear when the northern point of the Key Alcatraz bears east. When once the interior points are passed, you may anchor where you please, a chart of the harbor being a sufficient guide.

The coast west Xagua, or Jagua, is all of soboruco rock, and without any bank or shoal, for nearly 21$\frac{1}{2}$ miles, to the point of Caleta Buena (Good Cove;) it thence trends W. N. W. $\frac{1}{4}$ W., 6$\frac{3}{4}$ miles, to the east point of Cochinos, or Swine's Bay.

COCHINOS BAY is formed by the point above mentioned, and another point which lies W. by N. from it. The last is named Punta del Padre (Father's Point.) The bay extends 13 miles to the N. N. W. The edge of its eastern coast is of soboruco rock, without a bank, until at about a mile from the shore, when bottom is found in 15 fathoms, on sand and rock, diminishing the depth rapidly towards the coast. The western coast is a sandy beach, and sends out a bank to a short distance, but all of it is a rocky bottom. In the northern part of the bay is a landing place, which leads to the stock farms, (Haciendas de Ganado,) but it is little frequented, on account of its having so little bank, and the little that is having generally a bottom of sharp rocks.

Point Padre is very low, with a sandy beach. S. E. from it, at the distance of 6$\frac{3}{4}$ miles, lies Piedras Key, which is low, and of small extent. A little to the east of the point the bank which borders the west coast of the bay continues towards the south, and along the edge of it is a reef, which almost joins the north part of Piedras Key. The eastern side of this reef is very steep to, and has some openings, of 3 and 4 fathoms.

which allow a passage on to the bank. The most frequented one is that formed by the southern extremity of the reef and Piedras Key, both because the key serves as a mark for it, and because it has a greater depth of water than any of the others. The break which terminates this reef ends to the westward at the Lavandera (Washerwoman) Rocks, which lie about 4 leagues W. $\frac{1}{4}$ N. from Piedras Key.

From Padre Point to that of Don Christoval, all the coast is broken with lagoons, forming many keys, with groups of mangroves, having their roots growing in the water, or so close to it that the water washes in among them, and having no navigable channels. In this large space is comprehended Cayo Blanco, the south side of which is a sandy beach; and there is fresh water, in holes, at its eastern part. On that side, at the distance of a mile and a half from the shore, is the Lavandera Reef, which extends two miles east and west. The west point of it lies west $15\frac{3}{4}$ miles from Point Padre, and with another key, which lies to the N. W., forms the Boqueron (Little Mouth) of Calvario, which has little depth.

The Boqueron of Calvario, with the southern extremity of Diego Perez Key, which lies 6 miles distant from it, S. W. by W., forms the Bay of Cazones, which extends inland, N. W. by W., for about 7 miles. At the bottom of this is Masio Key. There are various small channels at the bottom of the bay, formed by Masio Key, which are connected with lagoons, lying along its sides, and at the north end of it. To the south of this key is a bank of 3 or 4 fathoms, sand and rock; but it is of no use, there being no communication thence to the main land of Cuba. At the distance of more than a mile and a half to the east from the south point of Diego Perez Key, a reef begins, which, stretching out with a turn to the S. E., unites with the eastern part of the Jardinellos, and is steep to. Between the same point of Diego Perez and the commencement of the reef, there is a passage on to the western bank, which begins with 7 fathoms, but in a short distance has only 14 feet. Four miles to the S. E. of the same point there is another channel, with first 3 fathoms, and very soon after only 2. There is no good mark for it, and the former is most frequented.

S. W. by W., a mile and nine-tenths from the Point of Diego Perez, lies the southernmost part of Palanca Key, after which follow in order to the N. W. by W., true, the chain of keys named Sal and Fabrica, and which, connecting with the main land of Cuba, at Don Christoval's Point, form innumerable passages, but with very little water. The southernmost keys of this chain, named Bointo, Cacao, and Palanca, are the marks for vessels sailing along the bank, which has no more, in many places, than 11 feet of water, and its bottom, of fine white sand, is studded with heads of rocks, with only 6 feet over them, but their color indicates what they are. This passage is bounded by the keys above mentioned, another key, Rabihorcado, to the south, and the edge of the Jardines Bank.

From Palanca Key, which lies $12\frac{1}{2}$ miles W. N. W., true, from Flamenco Key, the western Fabrica Keys take a turn to the N. E. by N., true, towards the main land, and they form a passage or channel with another chain of keys, to the west of them, called Don Christoval's.

Don Christoval's Point lies N. N. W., 2 miles, from Palanca Key; and from it the coast, which is low and swampy, trends W. N. W., for $18\frac{9}{10}$ miles, to a little key which lies at the entrance of a small bay called Matahambre. The interior of the country along this part of the coast is firm land, and is called the Savannas of Juan Luis. To the south of it extends a chain of keys, which are also called Juan Luis' Keys. There is a passage between them and the coast, as there is also between the east part of them and the west part of Don Christoval's; only, however, in any of the channels, for vessels which do not draw more than 10 feet.

N. W., at the distance of $3\frac{1}{2}$ miles from the little key which lies in the mouth of Matahambre, the Great Mangrove Point and the swampy land ceases. From this point the coast trends to the N. N. E. and N. E. for a short distance, and then to the east, to form the Ensenada, or Bay of Broa, which extends inland in that direction about 7 leagues. On the north it is bounded by the Point of Mayabeque, which lies N. by W., $15\frac{1}{2}$ miles distant, from the Punta Gorda. The shores of this bay are all of mangrove and swampy land; and on its north side are the branches of the Cienega, or Shallow Lake, which the natives of the country have distinguished by the names of the Rivers Guines, Guanamon, Mora, Nueva, and Belen, as far as Mayabeque Point. In this bay, as well as in the whole space of sea comprehended between the coast of Batavano and the keys in front of it, as far as the Cayamas Channel, the depth is from 3 to 4 fathoms, on clay.

To the N. W., and about a mile distant from the Point of Mayabeque, is the river of that name, in which vessels trading to Batavano can easily provide themselves with water. From this river the coast trends W. $\frac{1}{4}$ S. to the anchorage of Batavano, which is eight and a half miles distant from it.

From this place the coast trends to the west, 13 miles, to Point Cayamas; but in the intermediate space lies the Point of Cagio, and the river of the same name, in which the Batavano vessels sometimes also procure water.

The River Cagio, formed by the branches of the Cienega, runs into the anchorage of that name, in which, at a moderate distance from the coast, from $2\frac{1}{2}$ to 3 fathoms water are found, sheltered from all winds by the chain of keys which lies in front of it. The bight of the Cienega, comprehended between its mouth and the main land, is more extensive than that of Batavano or Mayabeque, and the lands around it are well cultivated.

Cayamas Point, and the chain of keys to the south of it, form the channel of the same name, which has 7 feet of water; this chain of keys extends with a bend to the S. E. by S., about 11 miles, when it forms the channel of La Hacha, which divides it from another chain of keys, which extends from this place as far as Cruz Key, lying 13 miles S. by E. $\frac{1}{4}$ E. from Batavano. The Canal de la Hacha has 11 feet of water, and is much frequented by vessels trading to Batavano, when they either enter or sail out to the westward of the Isle of Pines and Cayos de San Felipa (St. Philip's Keys.)

At a short distance to the westward of Cruz Key lies another, called Redondo, under which the vessels belonging to Batavano secure themselves in the season when the fresh (or stormy) S. E. winds blow: that is, in the months from July till October, (hurricane months,) which are much to be feared on all this coast.

To the southward of Cruz Key, at the distance of 2 leagues, lies Monte Rey Key; and between is a channel, with $2\frac{1}{2}$ fathoms, clay. This channel is the largest of those leading to Batavano, although care must be taken to keep clear of a spit, which runs out about 7 miles to the S. W. of the key; and to the heads, which are to the south of those keys, forming the north side of the channel.

From Cayamas Point the coast of Cuba trends W. by N. $\frac{3}{4}$ N., forming a regular bay, called Ensenada de Majana, and which terminates to the south, at Point Salinas, which lies $10\frac{3}{10}$ miles to the W. S. W. from the former. In the intermediate space, and near Cayamas Point, is the mouth of the River Guanima, at which the Cienega ends.

S. W. $\frac{1}{4}$ W., $12\frac{6}{10}$ miles from Salinas Point, a little point stretches outward. At a short distance to the north of it is the Creek of Savanna la Mar, which is much frequented by trading vessels. From the same point the coast continues forming a bay with Mediacasa Point, which lies $15\frac{4}{10}$ miles to the S. W. of the former.

Between this coast and the Bank, or Middle Ground, on which stand the keys to the northward of the Isle of Pines, the depth of water is from 3 to 4 fathoms, on a bottom of clay, except a spit with one and a half and 2 fathoms, which stretches out from the southernmost key about two leagues, to the S. W. $\frac{1}{4}$ W. of the Guanima Keys. The extremity of the spit lies S. $\frac{3}{4}$ E., $5\frac{1}{2}$ miles from Salinas Point.

The Guanima Keys are included in the group which, to the westward, form the Channel of La Hacha, and are situated to the southward of the River of Guanima and of Point Cayamas.

S. $\frac{3}{4}$ E., 12 miles from Mediacasa Point, lies Dios Key, between which and that point is the passage for vessels trading from this quarter to Batavano. Dios Key is low, and of small extent; it is detached, and the bank on which it stands turns to the eastward, and unites with that which surrounds the keys to the north and east of the Isle of Pines. It also forms a channel with the Indian Keys, and those of St. Philip, with from 3 to 4 fathoms depth of water.

From Mediacasa Point the coast trends W. by S., true, for about two leagues, after which, following S. and S. W., it terminates at Fisga Point, forming the bay of Ayaniguas: this point lies S. W. $\frac{1}{4}$ S., distant $10\frac{1}{2}$ miles from the former.

About S. $\frac{3}{4}$ E., $10\frac{1}{2}$ miles from Fisga Point, lies the easternmost of the Keys of San Felipe, from which this chain of keys continues in a westerly direction as far as the meridian of Guama Point; between these keys and the Indian Keys, there is a passage, with two fathoms of water; and the depth in the space of sea comprehended between the coast and the north part of them is generally from 4 to 5 fathoms, on clay and weeds.

From Guama Point the coast follows to the west, for about $2\frac{1}{2}$ leagues, to the Point and Creek of Guano, where the Bay of Cortez begins. From this place the coast runs W. by N., true, for about two leagues, to the bottom of the said bay; and the inconsiderable rivers of San Juan, Martinez, and Galafre, disembogue in it.

About W. S. W., true, at the distance of three leagues from the Point of Guano, disembogues the River Cuyajuateje; to the S. E. of which, at the distance of about a mile, begin three little keys, which, extending themselves in the turn more to the east, for about a league, form, with the main land of Cuba, the Lagoon of Cortez, which has about 3 fathoms of water; but the little passes formed by the keys have not more than 7 feet. Some huts have been established on them by persons who fish for hawksbill turtle, or the turtle which produces the tortoise-shell.

The southern extremity of this lagoon, which is on a parallel with the Keys of San Felipe, and about 5 leagues distant from them, is the termination of the Bay of Cortez, in which there are 3 and 4 fathoms water, on a grassy bottom. About two miles to the east of the south end of said lagoon, begins the deep water; the edge is very steep: it begins with 7 and 8 fathoms on a rocky bottom, and continues on so as to join the coast close to the northward of Point Piedras.

Point Piedras lies about S. by W. from the Lagoon of Cortez, 7 miles distant; the coast, which is low, but of firm land and rocky, with spaces of sandy beach at the shore, running nearly in the same direction.

From Point Piedras the coast, which has no bank, runs nearly S. W. by S. to the Point Llana, distant about 5 miles. This point is low, and has no other marks to distinguish it than the different directions of the coast, and some huts near it, and to the west of it there is a small sandy beach. To the S. E. a reef, which is very steep to, extends out about two cables' length.

From Llana Point the coast trends W. S. W. $\frac{1}{4}$ W., and more southerly to Point or Cape Leones, and then again follows the first of these directions as far as Cape Corrientes. All this piece of coast is of high soboruco rock, and without danger at a stone's throw distance.

CAPE CORRIENTES ends in a low point, with a sandy beach; and to the S. W. of it a short bank stretches off, on the edge of which are 15 fathoms; and close to the shore there are some rocks on which the sea breaks.

From the Cape the coast trends, without any bank, N. 3° E., true, for about a league, to Cape Cayman or the Point of Maria Gorda, and from it to the bottom of the bay, N. 40° E. The place called Maria Gorda is remarkable, being of soboruco rock, scarped, and higher than any other part of the bay; from it the bank again begins to run off with bad holding ground, the bottom being rocky; although farther to the north, and from the inflection which the coast makes, the bottom is sand; and very near the beach an anchor may be let go in 5 fathoms, with the precaution of having a cable on shore, as the edge of the bank is very steep. This is the only anchorage in this bay, and affords shelter for the strong trade-winds, and S. E. winds: none of the rest of the bay has any bank. The water met with in the lagoons of Maria Gorda, is brackish; but the fresh may be perceived rising in bubbles in the middle of the salt, and near the bottom of the bay, and about 6 yards distant from the water's edge. With industry, and in case of necessity, it may be obtained in a drinkable state.

From the bottom of Corrientes Bay the coast trends west, true, to the Balcones, which is a short piece of coast, of high soboruco rock. From this place it continues W. S. W., to Holandes or Olandes Point. This point, which bears nearly west, $5\frac{1}{2}$ leagues, from Cape Corrientes, terminates to the westward of the bay of that name. Near and to the east of it begins a reef, which extends in that direction about half a mile, but offers no danger, as it lies very close along the coast, and is very steep to. Point Holandes has an agreeable appearance, having a resemblance to the curtains of a wall, and extending with this figure about two miles, beyond which it descends in a kind of falls or steps, and the shore continues woody after passing it.

From Point Holandes, or Olandes, the coast trends nearly west to the point of Cayuelos, which is the southernmost point of the front of Cape San Antonio, or Cape Antonio. The westernmost point of the cape is called Pocillos, or Little Wells Point: and from this the coast trends N. 9° E., true, three-tenths of a mile, or thereabout, to Sorda or Deaf Point, whence the coast inclines more to the north-eastward.

To the eastward of, and near Cayuelos Point, extends the bank, which thence surrounds the cape half a mile from shore, and continues on to the northward, where it forms the Colorados Bank. Its depth begins with from 20 to 25 fathoms, on a rocky bottom, and diminishes regularly towards the coast, with some spots which have a sandy bottom.

The front of Cape Antonio is of low land, very rocky, and its shore appears with mixed streaks of soboruco rock and sandy beach. In its wells, called those of Cueva de la Sorda, (Deaf Woman's Cave,) and the Pocillos, (Little Wells,) water is abundant and of good quality.

Cape Antonio, (A,) bearing N. W. $\frac{1}{4}$ N., true, distant 5 miles.

Cape Corrientes looks very much like Cape Antonio; and in order to ascertain it, observe it is rather level land, of moderate height; but being near it or off it, in clear weather, some hills in Cuba, named the Sierras del Rosario, which stand toward the north coast, may be seen, bearing nearly true north. They are the only hills that can be seen from a similar situation, and present two summits only to the view.

Cape Corrientes, (A,) bearing N. 35 E., true, distant 4 miles.

The Isle of Pines, Jardines, and Jardinillos.

The form of the bank and reef which surround the isles or keys called the Jardines, &c., can be best understood by reference to the chart. Towards the N. E., on this bank, is Diego Perez Key, already noticed, and the edge of the bank thence extends to the S. E., forming a bight at the Megano or Sand Islet of Biscayno, whence it extends to the easternmost key of the Jardines. From the north end of the latter, a reef stretches out to the eastward, about a mile, and the bank extends in the same direction about 3 leagues, and nearly two north and south, with a depth of 15 fathoms at the edges, and 7 or 8 on the whole of it, excepting the proximity of the key, where 4 fathoms are found, on sand and rocks. This key, as well as all those which follow to the westward, under the name of Jardinillos, which extend as far as Key Largo, are regularly high, and scarped at the shores.

To the S. W., about 2 leagues from the easternmost key, follows the edge of the shoal water, with a westerly direction thence west for four leagues. It is studded or streaked with reefs, as far as a key which lies a league to the west of Trabuco. For about 5½ miles the same edge forms a bend, as it approximates the east end of Key Largo.

Largo Key, which extends W. S. W. and E. N. E. 13½ miles, is the easternmost of the Jardines, under which name are comprehended all those which follow it to the west, as far as the Isle of Pines. The south side of Key Largo is a sandy beach, bordered with a reef, which runs out about a mile from the east end; and afterwards approaches nearer, so as almost to join the west end of the key, whence the same reef continues, without any break, W. by S. and W. by N., true, to the Rosario Channel, which is 5 leagues distant from Key Largo. On the very reef, and near the west point of Largo Key, there are two rocky keys, named the Ballenates, distant a league from each other, and they are of moderate height. In all the space comprehended between the Eastern Head of the Jardinillos and the Rosario Channel, the bank which extends along the south side of the keys, does not extend farther out than one or two miles. Its edge begins with 15 and 18 fathoms of water, on a rocky bottom, and the depth diminishes rapidly to the very reef itself.

JACK TAYLOR'S REEF.—This dangerous reef, on which there is less than two fathoms water, lies south nine miles distant from Largo Key, between which and the shoal there is deep water; it is placed on the charts on the authority of Lt. Holland, H. M. S. Pickle.

Rosario Key, the west end of which bears north, true, from the channel to which it gives name, forms a channel of 3 and 4 fathoms of water, with another key to the westward of it, named Cantiles; but its outlet on to the interior bank, to the westward of the Passage Keys, has not more than 10 feet of water. The opening or channel through the reef, is a third of a mile in width, with a depth of 3 fathoms in the middle. It is steep at the sides, and at half a mile from its north part there is a rock, which shows above water. Vessels smuggling into Cuba generally enter and sail out by this passage.

From the Rosario Channel, the reef trends S. W. ¼ W. 10 miles; then W. N. W. ¾ W. 19 miles, to join the east point of the Isle of Pines. In this space are included the keys named Abalo, the Aguardientes, Campos, Matias, and many others which have no names. The outer edge of the bank is parallel to the reef, and generally extends out about 2 miles, excepting opposite of Abalo Key, where it runs out almost 3 miles, at about 7 miles to the south of the key. The least water on all this bank is 5 fathoms, on a rocky bottom, with some scattered spots of sand.

The ISLE OF PINES, when first seen, appears mountainous or hilly, of a moderate height, and the tops of its mountains very sharp. From its east point the south coast trends S. W. ½ S. for 5 7/10 miles, with sandy beach, as far as a point, which may be easily known, being of high soboruco rock, and having a detached rock (farallon) very near it. From this point the coast continues, without any bank along it, for seven miles, to another little point, which, with the former point, are the boundaries of the piece of coast denominated Playa Larga (or Long Beach.)

From the western point of Playa Larga, the coast continues W. and W. 5° N., true, for 8 leagues, to Cocodrillo, (or Corocodile Point,) which is the S. W. point of the island; and from the latter to the cove of the same name, is 3½ miles N. W. by W. In this cove fishing vessels sometimes take shelter. The coast continues N. W. for 8 7/10 miles, to Point Pedernales. All the ground between this and the west of Playa Larga is low and rocky, with shores of soboruco rock, and may be coasted along at less than half a mile. From Pedernales Point the coast bends, (forming a bay,) N. W. by N., 2½ miles, to Key Frances, which is the westernmost point of the island. Near the point are found the anchorage and watering place of Puerto Frances. This little roadstead, the bank of which extends about half a mile, with a depth of 5 fathoms, on sand, (and the shore is also a sandy beach,) is much frequented by vessels coming for timber, and affords shelter from winds of the N. E. and S. E. quarters.

Sierras de la Canada. La Daguilla. Caballos.

Isle of Pines, when the Mount La Daguilla bore N. 53° W., true, 25 miles.

Key Frances is separated from the coast by a small channel, and forms the west point of the deep Bay of Siguanea. From that point the coast trends to the S. E. for five leagues, all watery or swampy, and broken into keys; thence it turns to the N. E., up to the Lagoon of Siguanea, which lies at the foot of the hills of the same name, and has from 4 to 6 fathoms of water, but its entrance has not more than 9 feet; from it branches off a strip of water, which, in nearly an E. and W. direction, divides the island into two parts. At the foot of the hills of Siguanea there are two filters of excellent water, which at a short distance from the beach rise out of the land.

From the Lagoon of Siguanea, the coast trends N. W. by W. $\frac{3}{4}$ W., for 10 miles, to a little point which forms, to the west, the mouth of the Rio de los Indios, (Indian River,) whence the coast continues N. W. $7\frac{4}{10}$ miles, to Buenavista Point, which is the northernmost point of the Bay of Siguanea, and is $10\frac{3}{10}$ miles N. N. E. from Key Frances. Siguanea Bay extends $17\frac{1}{2}$ miles N. W. and S. E., and has from $2\frac{1}{2}$ to $4\frac{1}{2}$ fathoms water, on a grassy bottom; but the passage between Key Frances and the southernmost of the Indian Keys, has not above $3\frac{1}{2}$ fathoms, on sandy and grassy bottom.

The Indian Keys, separated by small channels, extend themselves to the N. W. by W. from the southernmost of them, which is 8 miles distant from the northernmost. The southern extremity lies N. $\frac{1}{2}$ W. from the point of Key Frances, $9\frac{1}{5}$ miles distant, and $4\frac{6}{10}$ miles W. $\frac{3}{4}$ S. from Buenavista Point; in the channel between them and the latter, there are from 4 to 5 fathoms water, on clayey and grassy bottom.

From the Point of Buenavista the coast inclines to the eastward as far as the Cove of Barcos, and the point of that name, which terminates it to the north, and lies 4 leagues N. E. by E. from the former. From the last point the coast trends N. N. E. $\frac{1}{4}$ E., to a short distance, and afterwards E. N. E., true, to the northernmost part of the island, which lies $3\frac{2}{5}$ miles distant from Barcos Point. From the northernmost point the coast continues E. $\frac{1}{2}$ N.; $5\frac{1}{5}$ miles, to a little point which lies to the N. E. of, and close to Nuevas River; thence it follows E. by S., true, about 5 miles, to the high hill, called Ojos del Agua. This hill or mountain is one of the highest in the island, scarped or precipitous on the north side; and close to are 3 fathoms water. Nearly in the middle, between this point and the former, is the mouth of the River of Casas, which rises at the foot of the hills of the same name; and which, together with Nuevas River, are the most frequented in the Isle of Pines by those carrying on traffic with Cuba.

In the same direction, from the mountain of Ojos de Agua, at the distance of 5 miles, is the hill of Vivigagua, also precipitous and of moderate height: from this hill the coast runs S. E. by E., $4\frac{1}{2}$ miles, to Salinas Point, and thence continues S. E. by E., $7\frac{3}{10}$ miles, to another point, to the north of the River Guayabo, and between the two disembogues the River of Santa Fé, which has excellent water. From the first a spit runs out, which, separating about 2 miles from the coast, joins it again at the river.

From the last point the coast winds to the southward as far as the eastern mouth of the Cienega. This part is named San Juan; and in the space is comprehended Mulatas Point and the River Guayabo, which disembogues close to the north of it. From the eastern mouth of the Cienega, (which divides the island in two,) the coast trends S. E. to Piedra Point, which lies N. by W., true, from the east point of the Isle of Pines, distant two miles.

From the Bay of Siguanea to Nuevas River, the shore is all watery and covered with mangroves; and from this river to that of Santa Fé, it is firm land, continuing generally so, though with some watery places, as far as the east head of the island.

From the Bay of Siguanea, as far as the River Guayabo, the coast may be run along at two miles distance, in 3 and $3\frac{1}{2}$ fathoms water, on a clayey and grassy bottom; but a passage farther to the eastward is prevented by the shallow bank which surrounds the Jardine Keys, and is here connected with the Isle of Pines.

INDIAN KEYS, &c.—From Key Frances the edge of the deep water follows nearly N. W., $11\frac{1}{2}$ miles, as far as the parallel of the southernmost Indian Keys, and at 7 miles to the west of it; and continuing from thence to the northward and N. W., so as to approximate the most northerly of the Indian Keys, it then extends so as to pass about a league to the southward of the easternmost of the Keys of St. Felipe, running parallel to those keys, as far as the middle of the chain; whence it nears them to within a mile, and continues along them at that distance, as far as the westernmost key, on the parallel of which it runs off to join the main land of Cuba, near Point Piedras. Generally, from Frances Key to the parallel of the southernmost Indian Key, from 13 to 25 fathoms are found at the edge of the bank; from the last named key to the meridian of the eastern-

most of the St. Felipe Keys, from 30 to 50 fathoms; to the southward of these keys, as far as the westernmost, 9 to 10 fathoms; and between it and the main land of Cuba, about 26 fathoms, except in the proximity of the latter, where it shoalens to 7 or 8 fathoms. The bottom of the whole is rocky; and very soon after entering on the bank, the depth diminishes to 5, 4, and 3 fathoms, on sand. All these keys have sandy beaches towards the south.

This great bank, which we have now described from east to west, is studded with keys, which, with the coast, and among themselves, form the outer channels of Diego Perez, of the Rosario, of Siguanea, and of Cortez; which afford a passage to Batavano, by the inner narrows of Don Christoval, Las Gordas, Monte Rey, and of La Hacha, all with a depth of 11 feet, except Monte Rey or Redondo Key Passage, which has 2½ fathoms, on clay.

Remarks on Cape Antonio, the S. W. of Cuba, and the Isle of Pines, by Captain Livingston.

At about two cables' length to the northward of the pitch of the Cape, you may, when the weather is moderate, land with your boats, picking out, by the eye, the best place among the rocks. At about 50 yards within the first trees or bushes, you will perceive a space of about two acres in extent, clear of wood. On the opposite side of that opening, where the wood again commences, and at about 10 or 15 yards into the wood, you will meet with very sharp coral rocks, among which are two wells, in cavities of the rocks, of about 7 feet deep. The water of the northernmost well is excellent, that of the southernmost not so good, but yet very palatable. There is a good rolling way from them to the beach, but boating large casks off is attended with difficulty, from sharp rocks which lie under water. We filled five or six puncheons at these wells on the 12th of August, 1817, and were not delayed altogether more than three hours.

There are plenty of excellent gray land crabs at Cape Antonio, which are quite safe to eat, there being no manchioneal trees hereabout: also plenty of pigeons, and other birds, some of which are likewise excellent.

There is a fisherman's hut and a turtle crawl on the southernmost part of the cape, at which you may, in the fishing season, generally find a person to point out the wells; but what I have said will enable any person, who looks carefully, to find them, though a person may be within 8 or 10 yards of them and not perceive them, without a good lookout. Men sent for water should always have their shoes on, to protect their feet from the sharp rocks. There is abundance of sponge to be found at the cape, although it is by no means of first rate quality. The fisherman's hut is one of the best marks for Cape Antonio, when coming from the eastward. Off the cape, about two miles out, the current often sets very strong to the S. E. When the current sets thus, it is advisable for handy working vessels to keep pretty close in shore, by doing which, they will avoid the strength of the current: this, however, is to be understood as applying only to vessels coming from the eastward.

ISLE OF PINES.—The most dangerous error in the charts and tables, of the positions of places on the south side of Cuba, is that of the latitude of the Isle of Pines, which is uniformly stated as lying in 21° 22′ N., whereas, the S. E. point lies, by a very excellent observation, taken on the 9th of August, 1817, in 21° 31′ 37″ N., my observation, and my mate's also, agreeing exactly in making our own latitude 21° 29′ 37″, and both of us agreeing in opinion that the land was fully two minutes due north from us.

This error of latitude, and the prevalent, though most erroneous idea, that the current sets always from the eastward towards the Channel of Yucatan, has, I have reason to believe, deceived many; as, after sighting the Caymans, and shaping their course for Cape Antonio, (more generally for Cape Corrientes,) the easterly current, which often runs very strong, causes them to make the Isle of Pines; and finding the latitude quite different from that assigned to it, are completely at a loss to know what land they have made, or fall into the more fatal error of supposing it Cape Antonio; and, hauling round the S. W. point of the Isle of Pines, get embayed among the Cayos de los Indios; and, perhaps, are finally lost in the bay, as was the case with a very fine ship a few years since. I have twice made the Isle of Pines when I considered myself to the westward of it; once when I expected to have made Cape Corrientes, and again, when, had it not been for a lunar observation, I should, from the courses steered, have thought us abreast of Cape Antonio. On the latter occasion, my mate and myself calculated the probable effect of the current, from the courses steered, distance run by log, latitudes observed, and time elapsed, after we passed the Grand Cayman, taking also the landfall made into account. My mate, an intelligent young man, made the current set S. 67° E., at the rate of 63 knots per day. The result of my own calculation, perhaps not so carefully worked as his, gave E. S. E., and two and a half knots per hour, which nearly corresponds with Mr. O'Harra's.

I had, some time since, the misfortune to be upset in a small schooner, belonging to Kingston, Jamaica, about two leagues from the south coast of the Isle of Pines: two ladies, (passengers,) and one man were drowned; and the remainder of us, with difficulty,

made the land, (owing to the current's carrying us off shore and to the eastward,) after about 13 hours of unceasing exertion. As many vessels have been cast away on this island within the last four years, and many more probably may be, while the charts continue so inaccurate, I subjoin the following remarks, the results of my own painful experience.

The Isle of Pines is very thinly inhabited, but I found it very difficult to obtain any exact account of the actual population. Most of the inhabitants reside in the north part of the island; indeed, so far as I could learn, there are only three houses on the south side, in an extent of twenty-one leagues. One of these is situated near Calabash Bay, at the east end of the island, and the other two nearly 2 leagues from Puerto Frances, or Siguanea Bay. There is also a fisherman's hut on Key Frances, sometimes called Bush Key; but it is inhabited only about five months in the year, viz: from March to August, being the season for catching the hawksbill turtle, from which the tortoise shell is got.

The houses are very hard to find, being all concealed among the trees, at a considerable distance from the shore; and it is perfectly in vain for a stranger to attempt finding them, as the paths which lead to them are no better than cattle tracks; and there are so many of the latter, intersecting the woods in every direction, that, unless a person is acquainted with the place, he must run much risk of losing himself in the woods, and of being starved to death; but he may possibly fall in with some of the inhabitants, or their dogs: the latter are very sagacious, and I have known one of them to save two men's lives, by conducting them to his master's house.

Water is to be found in some places, but in very few quite fresh. There is none quite close to the west end, except at Puerto Frances, where, about 15 yards to the westward of the most westerly cliffs in the island, a small path leads into the woods, by following which, a well of excellent water may be found, at about half a mile's distance from the beach;* it is in a hollow place, about 8 or 10 feet below the surrounding ground, and, unless when the sun is almost vertical, is little affected by its beams; and is, consequently, in general, extremely cool and refreshing. Casks cannot be rolled from the well, but all the water must be carried by men in small casks, buckets, or demijohns. There is not sufficient water to supply a vessel of any size; but it may afford seasonable relief in case of necessity, and I dare say supply two puncheons in 6 or 8 hours.

There is a kind of small beans, which grow upon a species of vine along the ground, and are inclosed in a rough pod; they are sweet to the taste, but extremely poisonous, and are therefore to be avoided.† To persons who may unfortunately be in the same predicament as I was, that is, destitute of food or the means of procuring it, it may be interesting to know that the thatch-tree, a species of palmetto, grows on the south coast of the Isle of Pines, in the most arid places, and is sometimes, as far as I can judge, 60 feet high. This tree, when young, affords a wholesome and not unpalatable food. Cut or break over a thatch-tree, of 7 or 8 feet in height, and tearing down the leaves in the neck, or, more properly speaking, at the junction of the leaves to the trunk, you will find a part of the inside, about as thick as a man's wrist, very white, and of considerable length, and which tastes like something between a Swedish turnip and the common cabbage. I did not know this when I remained five days without any thing to eat, excepting some raw shell fish; and for four days out of the five, we were constantly passing thatch bushes.

During the nine days I remained on the south side of the Isle of Pines, the current constantly set strongly to the eastward. The whole coast from the east end of the island to the S. W. point, is bold, close to; but off the S. W. point, and between that and Puerto Frances, dangerous reefs extend out to sea, to a considerable distance.

I regretted much that the loss of my instruments did not permit me to renew my observations for latitude on shore; but the day before the vessel upset I had a good observation, corroborative of that of the 9th August, 1817. I am, therefore, certain that the latitude is incorrect in all charts I have seen.

The Rio de Santa Fé is on the north side of the island; on the south side there are no rivers, unless it may be possible some small ones may empty themselves into some of the *esteros*, or salt lagoons. We waded across all those that we met with, excepting one, near their junction with the sea. There are one or two other rivers on the north side, but that of Santa Fé is the only one that has 2 fathoms of water at its entrance; though some have much more than that depth inside, but with bars at their entrances.

There is some mahogany and plenty of lignum-vitæ in the island; also, I believe, very fine lancewood.

In Puerto Frances, or Siguanea Bay, I am of opinion that, with good ground-tackle, a vessel may ride out almost any gale: so far, however, as I could judge from its appear-

* A fallen tree lies across the path half way to the well, and may probably remain there for many years.

† These beans grow on open spots near the shore.

ance from the shore; and shelter may be found under the lee of the reefs. A Spanish fisherman informed me that it was a much better place than it was generally thought to be, and had clean ground, bottom of fine white sand all over, within the reefs, with from 3 to 3½ and 4 fathoms.

On approaching the Isle of Pines from the southward, the first objects you will discover are three very remarkable peaked hills or mountains, on what are called the Sierras de St. Pedro. The land appears extremely arid and barren. The greater part of it on the south side is covered with wood, among which, however, many cattle and pigs find pasturage.

Between the Isle of Pines and Batavano there is a great number of keys, with shoal water between them. Among the roots of the mangrove trees on them, are many and excellent cray-fish.

The Spanish master of a schooner told me that he had entered among the Jardines, and went quite through, carrying not less than 7 fathoms; and I am disposed to believe him, only I consider its entrance must be much narrower than what we found the deep water between the Batavano and the Isle of Pines Keys; as, from the deck of a schooner of about 40 tons, we could not, when in mid-channel, see both at the same time. In the neighborhood of it are immense quantities of the palmetto real, or cabbage tree.

JARDINES.—In all the Jardines excellent fresh water may be found by digging a few inches deep in the sand, at a very short distance from the sea, according to my information, "not more than half a yard;" while in the Caycos de San Felipe, to the westward of the Isle of Pines, no fresh water can be procured. On the Jardines are also plenty of thatch trees. Some of the Spanish fishermen have remained six or seven days at a time on one of the Jardines, living upon the heart of the thatch tree, and upon the water got by digging, as before described.

The North-west Coast of Cuba, from Cape Antonio to Point Ycacos and Matanzas.

Having already given the description of Cape Antonio, &c., from the Derrotero and the notes of Captain Livingston, we shall here only notice that the cape has since been described as a low sandy point, with a flag-staff upon it, and several huts. From Cape Antonio the coast sweeps to the N. E., and thence to the E. and E. N. E., in a broken and variegated form, which can be best understood by reference to the chart. Without this coast, to the W., W. N. W., and N., is the extensive bank and reef called those of the Colorados, after described, which are naturally divided, and ought, therefore, to be distinguished by different names, that is to say, the Antonio Bank and Colorados.

Following the Colorados, to the east, are the Banks and Reefs of Isabella, which terminate at the entrance of the harbor called Bahia Honda, in longitude 83° 7′. A too near approach here is very dangerous, as the reefs are generally very steep, and the current from the gulf sets along them mostly from the N. W. to W. and S. W., whence it sweeps along the edge of the bank, near the shore, round Cape Antonio, and thence eastward towards Cape Corrientes, &c.

The Derrotero says, that "between the bank (that of San Antonio) and the reefs and keys of the Colorados there is an interior passage, for vessels of 11 or 12 feet draft, but much experience is required for taking it; and all vessels are recommended to pass outside, keeping well away from the edge of the reef, which is very steep to; and near it a vessel may be entangled by eddies proceeding from the general current of the strait."*

Mr. Gauld says it is high water at Cape Antonio, on full and change days, about 9 h. 33 m., and that the vertical rise is 18 inches. The flood sets to the southward,† and the ebb northward. The velocity is about three-quarters of a mile in an hour.

From Cape Antonio, the bank, which appears of a whitish color, with only 10 or 12 feet water on it, trends north, by compass, about 8 miles, whence the edge turns gradually round to N. E. by N., and north-eastward, to lat 22° 8′, with very uneven soundings, from 6 to 3 fathoms, rocks and sand. To the eastward and southward the soundings decrease from 6 fathoms very gradually to the shore, all fine sandy ground. The late Mr. Owen, of Jamaica, said the edge of the bank is clean all along, and steep to, and that he had run along it, at a very short distance, in a line of battle ship, guided by the eye, and himself keeping at the mast head.

In proceeding from Cape Antonio to the northward, it is requisite to be aware of a shoal, seen in 1797, and which is represented at 14 miles N. N. W. ½ W. from the cape.‡

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* Mr. Finlaison says, when you are abreast of Cape Antonio, you will perceive the discolored water on the bank, and should take care not to approach too near, particularly in light winds, the edge being steep to, with generally a current setting over it.

† The flood, therefore, bends with a southerly current; and thus it appears to continue eastward, within the Isle of Pines, &c.

‡ The British ships Clara and St. Vincent sounded on this shoal, and found 5 fathoms, sandy bottom; they were two hours in passing over it, but do not mention the rate of going. Cape Antonio bearing S. S. E., 15 miles distant.

It seems that Mr. Bishop was once near this bank. He says that, having worked from Cape

In the day time you may safely take the passage between this shoal and the edge of the bank; but in the night, or in thick weather, it is better to make sure of passing outside of it. It is also proper not to forget the bank of Sancho Pardo, which lies about 6 leagues to the W. by N. from Cape Antonio, a near approach to which is unnecessary.

If, when at Cape Antonio, the wind comes to the north, it will be best to maintain yourself to leeward of the cape, either on short boards, or by coming to anchor; because, with such a wind, in place of advancing on your passage, you would probably be caught in a gale or storm.

The Colorado Reefs and Keys are very extensive. The S. W. extremity lies in about 22° 19′ N. and 84° 48′ W. The whole are, in general, steep to. Of the principal rocks or keys, the westernmost, or Black Key, shows itself above water like the hull of a ship, and may be seen 4 miles off; the other two, Colorados, or Red Keys, are not seen unless the weather be quite calm: they have not above 2 feet of water on them; and to the westward no ground is to be found at a short distance, or less than a mile. The channel between is half a mile wide. Between the Black and Red Keys is a depth of 4 fathoms, but very foul ground. Capt. Street, in his account of these rocks, gives the following detail: "We took our departure from 4 or 5 leagues, abreast of Cape Antonio, and made our way good N. E. by N., 15 leagues, and then fell upon the Colorados in 3 feet water. They were about me dry in several places, without any distinction of swells and breakers: we saw flocks of pelicans sitting upon the reddish white sand. In this place we could see no dry land from the top-mast head, though very clear weather, but we saw to the east of us three hummocks on Cuba; the innermost, or biggest, bearing E. by N. so near us, that we could see other hummocks within and without these three, and low land trending away from the innermost hummocks to the southward, and likewise the hummocks almost join with the low land between them. All this we could see on deck, or but two or three ratlings up; but the three aforesaid hummocks we raised upon deck, when we were about 8 or 10 leagues off our aforesaid station of 5 leagues to the westward of Cape Antonio."

The high lands of Cuba are in many places particularly marked. The principal lands thus remarkable, in regular succession from west to east, have been enumerated as follow: the High Lands of Buenavista, the Coxcomb,* the Saddle Hill, Dolphin Hill, Tables of Mariel, Maiden's Paps, to the southward of the Havana, Iron Hills, to the eastward of the Havana, and the Pan, or Loaf, or Hill of Matanzas, to the S. W. of the port of that name. The appearances of all these may be seen on the new chart of the Gulf and Windward Passages, as well as on the old chart by Mr. Romans. Those noticed in the Derrotero, are the Hills of Rosario,† the Gap of Yoldal, (we presume, the notch in the Coxcomb,) the Pan of Cavanas, or Dolphin Hill, the Tables of Mariel, the Tetas de Managua, or Maiden's Paps, the Sierra de Jaruco, or western part of the Iron Hills, and the Pan of Matanzas. These, it is added, are all points from which a ship's situation may be ascertained in clear weather; but it frequently happens, in hazy weather, that they cannot be seen from sea at 5 leagues off.

BAHIA HONDA, &c.—The harbor called Bahia Honda, or Deep Bay, is situated at the eastern end of that range of islands and reefs distinguished by the name of Isabella. Its entrance, according to the Spanish officers, is in latitude 22° 59′, longitude 83° 71′. When you are before that entrance, it bears nearly south, but you cannot get in till the sea breeze comes on, at about ten in the morning.

Bahia Honda is a spacious and well sheltered harbor, but the points which form its entrance, as well as the interior points, are bordered with a reef and edge of shallow water. The outer point, on the east or windward side, is named El Morillo, (Little Morro,) from its presenting a rising ground. From this a shoal extends two-thirds of a mile to the N. W., having, however, at its extremity, a depth of 5 fathoms. The outer point on the west, is Punta Pescadores, (Fisherman's Point,) from which a reef extends to the N. N. E. about one-third of a mile. The distance between the two points, which are nearly east and west, true, from each other, is about two-thirds of a mile; but the channel formed by the edges of the shoals is only a cable and a half in width.‡

At a third of a mile within the exterior points are two others, Punta del Cayman, on the west, and Punta del Real, on the east; and between these the breadth of the channel

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Antonio to the N. N. W., about 5 leagues, he had soundings in 15 fathoms. He then went up to the mast head, being the main-top-gallant-mast of the Sphynx, a 20 gun ship, and from thence saw the tops of three small hills to the eastward, with Cape Antonio bearing S. S. E., distant 5 leagues.

* Mr. Finlaison says, "With the Coxcomb Mountain bearing S. ½ E., you will be in long. 84° W."

† Probably the high lands of Buenavista; for the charts of this part are yet inaccurate and contradictory.

‡ In a late description of Bahia Honda, by a British officer, it is said that it may be known by a remarkable tower and a small hut on the eastern side of the entrance, and a large plantation on a round hill just on the back of it, and two small huts about 1½ mile to the westward of the west point of the entrance.

does not exceed 2 cables' length. From Point Real the edge of the bank extends at the distance of two-thirds of a cable; but from Point Cayman not more than half a cable's length. At half a mile further in, the harbor opens, and you arrive off Punta del Carenero, which is on the eastern side. At a third of a mile to the southward of Point Carenero is an island, Key Largo, or Long Key,* the west point of which (Punta di Difuntos) lies a little more to the west than Point Carenero, and it may therefore be seen from the sea.

To enter this port, it is requisite to keep at some distance from the coast, and outside the edges of the reefs, till you are N. ¾ W. from the mouth, when you may run for it. When near it, or at about the distance of a mile, you may perceive Point Difuntos; and placing your vessel most carefully to S. ¾ E., you may steer in that direction; as with that course, keeping Point Difuntos open, in the mid-channel, you will run in with sufficient water, 18 to 6 fathoms. When abreast of Point Carenero, you will see to the W. S. W. a long point on the west side of the harbor, named Punta de Mangles, or Mangrove Point.† With this in sight, you may now steer to the S. W., and when you have arrived on a line between it and Point Difuntos, you may anchor in 7 fathoms, upon clay; or, if more convenient, you may luff up to the south-eastward of Point Difuntos, and drop your anchor in 6 fathoms, same ground. There is also anchorage to the northward of Key Largo, between it and Punta del Carenero, in 6 or 7 fathoms, which may be found, after sailing in by the lead, along the reef on the eastern side.

THE BAHIA BANK lies rather more than 5 leagues to the N. W. by N. from the mouth of Bahia Honda. It extends nearly east and west a league in length, and is about half a league broad. On this bank you may come to an anchor, taking care that you do not go too near the rock that lies in the middle of it. There is no water on the rock, and when the breeze blows strong the sea breaks over it; but on the bank are 6, 5, and 4 fathoms of water.

PUERTO DE CAVANAS, OR PORTO DE CAVANAS.—This harbor lies rather more than 4 leagues to the eastward of Bahia Honda. It has an extensive reef on each side of its entrance; yet it is a fine bay to sail into, having 5 and 6 fathoms at the entrance, deepening to 8 and 10 within, with room enough for several hundred sail of ships. The Derrotero says, you may run along the coast between Bahia Honda and this place, at the distance of 2 miles. Port Cavanas is a good anchorage, sheltered from all winds, and fit for any class of vessels. It may be known by a round hill, which forms a gap or break, and upon the summit of which there is a grove of trees, and by another hill, named the Pan of Cavanas (Dolphin Hill.) The latter descends gradually towards the east, until it ends in low level land, which continues for a long league, until it meets the table land of Mariel. In addition to these marks, you may see upon the coast two rows of hillocks, which resemble shepherds' huts, and from which the place has derived its name. These hillocks lie to the eastward of Bahia Honda, and the Pan of Cavanas appears as if in the middle of them.

To enter this harbor, you ought to open the mouth well out, until you are on its meridian, and that of the east part of an island, (Isla Larga,) which is within the harbor, on its west. Steer S. ¾ E. until past the reef of Punta Longa, on the east side, when you may luff up, and anchor in from 7 to 9 fathoms. Be cautious, in advancing, not to touch on the reefs on either side; that to windward extends out more than half a mile, and that to leeward about 2 cables' length. At the extremity of Punta Longa, the reef extends out only two-thirds of a cable; but the channel here is only 2 cables in breadth. Another reef extends to the same distance, northward, from the eastern point of Larga Island.

PUERTO DEL MARIEL, OR PORT MARIEL, which is 4½ leagues to the eastward of Port Cavanas, is large, well sheltered, and fit for any class of vessels. You may know when you are to the north of it by the Tables of Mariel, which are moderately high, and form very broad table lands or hills. On approaching these you will perceive various white patches. The coast hence trends to the eastward, towards the Havana, and is very low. In proceeding towards the latter, you may descry the Paps of Managua, commonly called the Maiden's Paps, which are two round hillocks, lying on the meridian of the port. To the westward of Mariel the coast is likewise low, for a long league, until it rises and forms the Hill of Cavanas. Farther to the west may be distinguished other high lands in the vicinity of Bahia Honda, and which seem to rise from, or to be surrounded by the water.

To enter Port Mariel, you have only to steer towards the western extremity of the Tables; and having recognized it, may run in, along the windward shore, at the distance of a cable's length. This will lead clear of the reef which borders the coast, and on which the sea breaks. Having the mouth of the harbor well open, place your vessel's head towards a small rocky key, which lies off the leeward point; and so soon as you are

* Wood Island of the old English charts.

† Long Point of the old charts.

within two-thirds of a cable from it, steer S. $\frac{3}{4}$ E., or, what amounts to the same, steer in that direction, when the leeward point of the interior part of the entrance has the same bearing. Continue this course until you pass the round tower, which you will see on the windward side. You may then luff to port, (larboard,) so as to maintain yourself at a cable's length from the eastern shore, and you may anchor upon it, where you please, in 8 or 10 fathoms water. If more agreeable, you may run into the interior of the harbor, for which a reference to the plan of the harbor will be a sufficient guide. We only add, that, as the narrowest part of the entrance is only 50 yards wide, it is requisite to be very cautious on entering with a large vessel.

It sometimes happens that strangers mistake the land to the westward, and about Bahia Honda, for the table land of Mariel; but it is to be observed that the latter is not so high, and is more regular than any land near, or to the westward of Bahia Honda.

HAYTI, OR SAINT DOMINGO.

This island, once more called Hayti, its original name, was discovered by Columbo, (Colon, or Columbus,) in 1492. By Columbo it was called Hispaniola; but giving the name of St. Domingo to a city which he founded in 1494, the whole island, in process of time, came to be so called. At length the island was divided into two parts, under the respective governments of Spain and France, when the name of Hispaniola was limited to the eastern or Spanish portion; and finally, the whole is now independent, under the title of the Republic of Hayti.*

To the natives, the climate, though hot, is healthy; yet it is exceedingly pernicious to Europeans, and the shore of Hayti has been the grave of thousands, who have been the victims of its heat and moisture. Many of the inhabitants are, nevertheless, said to live to a great age. The thermometer in the plains rises as high as 99°, but the country is continually refreshed by breezes and rains, and its salubrity is increased by the beautiful variety of its surface, exhibiting hills and valleys, woods and rivulets. Its highest elevations are about 6000 feet above the level of the sea, and its hills are covered with forests of mahogany, Brazil wood, palms, elms, oak, pine, walnut, gayac, maple, ironwood, cedar, ebony, &c. The island is said to have its mines of gold, silver, copper, quick-silver, iron, lead, precious stones, and chrystal.

The rivers are numerous, but none are navigable, even by boats, in the dry season: in the rains, they often rise 25 feet perpendicular, and sometimes spread destruction over the plains.

The principal towns are the city of Cape Haytien, formerly Cape François, in the N. W., the city of St. Domingo, in the S. E., Port au Prince, Leogane, and the Mole of St. Nicholas, in the west.

We commence the description of the shores of Hayti with the Mona Passage and eastern coast, and thence proceed in succession with the southern, northern, and western coasts, as this seems to be for the mariner the most convenient mode of arrangement.

The Mona Passage and Eastern Coast of Hayti, from Cape Raphael to the Island Saona.

The channel called the Mona Passage, between Porto Rico and Hayti, is 26 leagues in breadth, and generally clear and safe, with the exception of shoals in the vicinity of the coasts of the two islands. On the N. E. side, the land of Porto Rico is low, to the westward of the harbor of Arrecibo, until it reaches Punta de Pena Agujereada, (or Point of the Holed Rock,) where a kind of cliffy high land begins, which trends S. W. rather more than a mile, to Point Bruguen, the north-westernmost point of Porto Rico. The coast again declines in height, and forms a convex bow to Punta de Penas Blancas, (Whitestone Point,) the north point of Aguadilla Bay.

DESECHO, OR ZACHEO.—This little island, nearly covered with trees, stands like a beacon in the ocean, at the distance of $11\frac{1}{2}$ miles W. $\frac{1}{4}$ N. from Point St. Francisco, or Porto Rico. It appears like a green mountain, 800 or 1000 yards broad at the base, and is so high as to be seen at 12 leagues off. The coast is generally clean, and there is no danger but what may be seen.

MONA PASSAGE.—We found the winds generally light in this passage, and but little current. The Island of Zacheo, bearing W. by N. $\frac{1}{2}$ N. 11 miles from Aguadilla Bay, may be seen on a clear day from any part of it. It is high, and very bold. We frequently approached it very close, without observing any danger, or getting soundings near it. Off the north and south ends there are a few rocks, but close to the shore it is covered with small brushwood, and the landing place is on the south side.

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* The whole was united under one government, General Boyer, President, in 1822.

MONA AND MONITO.—These isles lie nearly in the middle of the Mona Passage, towards the south.

MONA ISLAND.—This island is nearly level, and of moderate height. We could not see it farther than 18 miles on a clear day. Its north-east, south east, and south-west sides, are bounded by a reef a quarter of a mile off shore. At the distance of two miles, we ran along these sides, but saw no other danger than a reef, which extends one mile and a half off the south point.

The S. W. point (to the northward of which is the anchorage) is sand, long and low, with brushwood and small trees on it. There is a reef off this point, about a quarter of a mile in length, to the westward.

We anchored here in his Majesty's ship Arachne, with the sandy point bearing S. by W. one mile and a half; island of Monito, N. ¼ E.; N. W. Point of Mona, (high and bluff,) N. E. ¼ N.

We come to our anchorage from the northward, passing Monito to the westward within 6 miles, but had no soundings; neither could we see broken water, or any danger between it and Mona. This island is the resort of innumerable quantities of boobies; its sides are very white, and are inaccessible. Our anchorage was off the sandy bay formed by the S. W. point, (bearing as above mentioned,) sandy bottom; this, the N. W. side, is also bounded by a reef, about three cables' length from shore: the passage through it is nearly in the centre of the bay, but it is narrow, and a boat must pick her way through. The soundings are very regular; we found 4 fathoms close to the reef; and there would be no danger in anchoring within a quarter of a mile of it, bearing in mind it is open to all westerly, and from south to south-east winds.

We landed on the sandy beach, and found the west end of the island, which is low, covered with small trees, brushwood, and, at a few cleared spots, white grass; in the latter of which were small pools of fresh water, apparently dug, but of bad quality: around these we found the print of the hoofs of cattle and horses, or mules, very recently made, as was evident by the sun not having hardened the soil. These pools of fresh water were on the south-east side of the sandy point, about one mile and a half from the landing. We did not find any signs of habitation or inhabitants; and, excepting the before mentioned fresh-water pools, we saw no possibility of obtaining water. A small quantity of fire wood might be obtained, but with labor. The remarks on this island in the Columbian Navigator are imperfect; they give the anchorage in the following bearings: Monica Island, N. by W.; S. W. point of Mona, S. E.; but it is not possible to bring these bearings on.

Near the west point, however, some vessels anchor, in order to procure grass, when engaged in carrying cattle. The island may be seen at the distance of 6 leagues.

Monito is an islet, the greatest extent of which scarcely reaches to two thirds of a cable's length; it is much lower than Mona, and in shape resembles a shoemaker's last; on its surface no bush is seen, and it is the perpetual resort of immense numbers of booby birds. The pilots of these coasts state that there is a clean and deep passage between it and Mona.

EASTERN COAST OF HAYTI, OR OF ST. DOMINGO.—The eastern shore is generally low, but the land may be descried at the distance of 10 leagues. Cape Enganno, the easternmost point, lies in lat. 18° 34½′, and long. 68° 20½′. From this point the land of Porto Rico may, in clear weather, be seen.

From Cape Enganno to Cape Raphael, the bearing and distance are N. W. by W., 14 leagues; at about 3 leagues to the south-eastward of the latter the land rises, and so continues to the cape.

Cape Raphael is of moderate height, and appears at a distance like an island. It is distinguished by a conical peak island, which resembles a sugar loaf, and is commonly called the Round Hill. The shore eastward is not only low but foul, and ought not to be approached nearer than a league. At rather more than half way from Cape Raphael towards Cape Enganno, is Point Macao, on the S. W. of which is a little town of the same name.

Cape Enganno is low by the sea, and a shoal extends from it nearly 3 miles to the N. E. This shoal, having little water on it, must have a good berth. Cape Enganno, bearing W. by S. 6 leagues, makes with two heads like a wedge.

From Cape Enganno the coast trends to the S. W. and south to Point Espada, which is low and bordered by a white shoal and reef. From this point to the S. W. the coast forms a bay called Higuey, and a smaller one, Calamité: both are very foul, with reefs. To the southward of the latter is the Island Soan, having a channel of considerable breadth between it and the land of Hayti; but it is so obstructed as to be impassable to any but small craft.

To the Southern Coast of Hayti, from Soan to Cape Tiburon.

THE ISLE OF SOAN, which lies off the S. E. coast of Hayti, is about 13 miles in length from east to west. It is covered with trees, and is surrounded by a white shoal

to the distance of nearly two miles. The position of the eastern point of this isle, according to the Spanish observers, is lat. 18° 12′, and long. 68° 31½′. At the western end are several islets on the bank.

From the S. W. extremity of Soan to Point Caucedo, on the eastern side of the bay of St. Domingo, the bearing and distance are W. ½ N. 16½ leagues. The coast between is in general tolerably clean; for there is only one place, the Playa de Andres, (Andrew's Beach,) which has a reef, and this stretches out to sea about a league; but at four leagues from Soan, is the little island of Santa Catalina, (St. Catharine,) the eastern part of which is narrow, and the western foul.

On the west of Cape Caucedo is an anchorage, named La Caleta, which affords shelter from the breeze. The coast hence sweeps to the westward, to form the great bay of St. Domingo, at the bottom of which the river Ozama disembogues. On the western bank of this river stands the city of St. Domingo. Along all the front of the bay is a sand bank, the Estudios, having 5, 6, and 8 fathoms water, and extending about half a mile out to sea. On this bank vessels anchor, but with some risk, especially in the season of the souths, which raise a heavy swell, and there is no shelter from these winds; added to which the coast is wild and rocky, without any beach, and the sea breaks on it with violence. The safe anchorage is within the river, but it has a bar of rock which prevents vessels drawing more than 13 feet from taking it; and even these are in danger of striking during the souths.

To anchor on the Estudios Bank, it is necessary to coast the windward land from Cape Caucedo, at the distance of from three cables' length to half a mile. It is very clean and deep, and only on the eastern point of the river is there a shoal of little water: this stretches out about two cables' length, and to keep clear of it you must not haul to the northward, in any degree, until the west point of the river bears north.

The city of St. Domingo, which is the metropolis of the eastern division of Hayti, is situated, according to the late observations, in latitude 18° 28′, and long. 69° 50′. It stands on the right or western bank of the River Ozama, the entrance to which may be known by a great fort on that side. To the westward of this fort is a large savanna, which forms an amphitheatre, and makes a beautiful prospect. The harbor is very commodious, and ships may lie close to the shore to take in their lading, by planks, from the wharves.

The city is built on a rocky point. The streets are at right angles, N. and S. and E. and W., and have footways of brick. The greatest part of the town is built of marble found in the neighborhood, and in the style of the ancient houses of France and Italy. The more modern houses are of clay, which acquires the hardness of stone, or of wood, thatched with the leaves of the palm-tree. The cathedral is spacious and magnificent. The population is computed at more than 20,000. The fortifications have been judiciously constructed, and the town is surrounded by a thick wall.

To sail into the harbor, run in directly towards the church with a flat steeple, and to within a mile of it. Here you will have 15 fathoms of water, nearly opposite the eastern point, and a little within, off a small fort on the larboard. Run in directly: you cannot do amiss.* Towards the sea there is no danger.

In navigating off this coast, allowance must always be made for the currents, which set most frequently to the eastward; and there is very commonly an indraught into the Bay of Nave, to the west; which must, of course, in some degree, affect the navigation towards that of St. Domingo.

Remarks and Directions for St. Domingo, by Capt. Mackellar.

"The anchorage is about three-quarters of a mile from the shore, and is open to all winds, from S. S. E. ½ E. to S. W. by W., and when the sea breeze is at all to the southward, there is of course a very heavy swell. The bottom is of black sand and mud, apparently a good holding ground. Ships intending to anchor here, and being round Point Nisao, with the tower in sight, ought to keep well to the eastward; and when the tower bears N. N. W. they may steer for it, keeping it in that bearing, until within a mile and a half of it; then bring the west point of the entrance of the river, on which stands a signal-tower, to bear N. ½ E., and in a line with some houses on the east side of the river; these houses stand within the river's mouth on a small sandy beach; and by keeping them in one with the west point of the river, bearing N. ½ E., will carry you into the best anchorage.

"On coming within a mile of the town, you will get soundings of 40 or 50 fathoms; the next cast 15; then 10, and from that it shoalens gradually to the shore. The bank being very steep, I should recommend to ships having the wind free, to shorten sail in good time, and run in with their sails clued up: by doing this you will get your sound-

* It has been said, that since this description was written, the depth of the harbor has been reduced by an accumulation of sand; caution in entering is therefore necessary.

ings true; and so soon as in 8 or 9 fathoms, let go your anchor, not waiting to round to, as there is but little room.

"The east point of the entrance of the river is a flat rocky point, and stretches considerably out farther than the west point. The east point will be the nearest land to you when you anchor, bearing about N. E. The whole of the town is on the west side of the river, and has been well fortified, but the fortifications at present are out of repair. The river forms an excellent harbor inside; but has a bar of solid rock at its entrance, with never more than 13½ feet water on it. The pilots here affirm that the anchorage outside is perfectly safe; in my opinion it may be well enough to stop a day or two in that season of the year when the weather is settled; but not, on any account, should a ship anchor here during the hurricane months.

"I had no opportunity of determining the situation of this place while lying here. I got the latitude at anchor by two stars, one on the north, and the other on the south; they gave the anchorage 18° 27′, and the town was nearly a mile north of us. I should say the latitude of the town was about 18° 28′, but not to be depended upon."

Point Naiso is the western point of the Bay of St. Domingo; and to clear it in going out from that anchorage, you must steer S. by W., or S. S. W., and having run 14 miles on either of these courses, you will be to the southward of it.

From Nisao Point the coast trends about S. W. and W. S. W., and is so clear that you may run along it at less than 2 miles. It then sweeps to the westward towards Nave Bay, in which there are various harbors and anchorages.

Salinas Point, on the east side of Nave Bay, is in latitude 18° 12′, long. 70° 36′. From this point the coast extends to the N. E. a mile and a half, to Caldera Point, where a large bight begins to form. Here is an inlet of two miles to the east, in which every class of vessels may anchor in the greatest security, sheltered from both wind and sea. The mouth of this harbor (that is, the space which intervenes between Caldera Point and the nearest land) is half a mile wide, but the good and deep channel is reduced to a cable's length; for a rocky shoal, at the edge of which there are 4½ fathoms water, stretches out about 3 cables' length from the coast; and another of the same kind, and with the same depth of water at its edge, runs out to half a cable from Caldera Point. The depth of water in this channel is from 7 to 8 fathoms, on oozy sand. Although this harbor is large, the ledge of rocks which borders the coast rounds the whole interior of it, and reduces it much: it is also further reduced by various rocky shoals in the very anchorage, but they have between them good and deep channels. As these shoals obstruct it so much, it is extremely difficult, even with a good knowledge of it, to enter it under sail, and totally impossible if you are not acquainted with it. In addition to this, on account of the narrowness of the channel, you cannot work in, and therefore no one should enter into this bight otherwise than by warping or towing; having previously anchored to the north of Caldera Point, and at about a cable's length from it. In order to this, you must keep within 2 cables' length from Salinas Point, and preserve the same distance until you are past a small point, which the coast forms between Salinas and Caldera Point, which is foul, and sends out a rocky shoal, on which there are no more than 2 or 3 fathoms water. Having passed that point, which is called Rancheras Point, you may run within less than one cable's length of the coast, if you choose to make Caldera Point, and anchor in its vicinity. If the wind is not favorable for obtaining this situation, you may tack in, but take care on both boards, to tack in 8 or 10 fathoms, that you may keep clear of the ledges. If once anchored outside, you must get a warp carried out by your boats, (which must also examine and ascertain the proper channel,) and having warped two or three cables' length farther in, you will be in a very secure and well sheltered anchorage.

From Caldera Point the coast trends towards the N. W. to the Point and River of Ocoa; whence it returns towards the N. E., and forms a very extensive roadstead, which is sheltered from the breezes: but the bank, which is of sand, is so steep, that the anchors are apt to drag, and the cables sometimes fail, being damaged by the loose stones which are in the bottom. From these reasons vessels may anchor very near the land, and send a cable ashore, which they make fast to some of the palm trees that are on the bank, having also a cable laid out for the changes of wind which take place in the night from the W. and W. N. W., and which render it necessary for those who take this anchorage to wait until the breeze comes in, which happens at 10 A. M. With the breeze you leave Ocoa Point well prepared to receive the gusts of wind which come off the coast, for they are very heavy.

From Ocoa Roadstead the coast follows to the north for 4 miles, and then to the west 8 more, where it begins to take to the south, to form the west coast or shore of the great bay.

Near the turn where the coast begins to descend to the south, there is a harbor named Escondito, or Hidden Harbor, which lies nearly N. W. from Salinas Point. The mouth of this is more than half a mile in width, and to enter it you must keep near its south point, which is clean; and the water is so deep that at half a cable from it there are 5½

and 6 fathoms. A reef stretches out a cable's length from the north point. Half a mile within the harbor, and in the direction of the middle of its mouth, there is a rocky shoal, which is two cables' in extent from N. to S., and one from E. to W., and upon which a vessel must run, if keeping in the middle of the harbor, and steering N. W. To avoid it you must keep within two cables' length of the south shore, and anchor about half a mile within the harbor, but not farther in with large vessels, for the depth diminishes so that at two cables farther in there are only 15 feet of water. You can also anchor to the north of the shoal, in 5 fathoms, taking care not to run farther in than 3 or 4 cables' length from the mouth. In fine weather this harbor is excellent for vessels which do not draw more than 13 feet, which may enter, and be sheltered from all winds. Frigates and ships of the line remain always exposed to some swell from the S. E., and had better be, in this case, near the south than the north part of it.

BEATA POINT, OR LITTLE CAPE MONGON, is the southernmost point of Hayti. Its bearing and distance from Punta de Salinas are about S. W. ½ W., 16 leagues. Of the coast between we have no particular description. Eight miles to the north-eastward of Beata Point is Cape Mongon, and between these points appears the high mountainous land of Bauruco.

ISLE OF BEATA.—This island lies to the south of Beata Point, and is 1½ league in length from N. to S., and about 2 miles broad from E. to W. It is low, and covered with bushes. There is a breaker off the N. by E. side of it, stretching towards Cape Mongon, at the extremity of which is a white shoal, that very much narrows the passage between Beata and the shore. In the passage are but 3 fathoms of water. There is anchorage to the westward of Beata, between it and the shore, in 7, 8, and 10 fathoms, sandy and weedy bottom, with the N. W. end bearing about N. by E., or N. N. E., one mile, and the S. W. end S. by W., four miles.

East of the isle the water is deep, and there is no ground at a short distance from it with 50 fathoms of line. There is, nevertheless, a shoal stretching from the S. W. point, to which a small berth should be given, as there are no more than 4 fathoms of water west, 3 cables' length from the point. When the latter bears E. S. E. you may haul up from the N. W. end. In the anchorage there is good fishing.

The Frayles, or Friars, a number of steep rocks above water, lie west 3 leagues from Beata. The sea breaks over part of them, and they are so bold to that vessels may sail within a quarter of a mile round; but it will be prudent not to approach within a mile.

Near all the isles off the main coast the bottom may generally be seen; but near the shore of Hayti the water is very deep. The coast hereabouts is a flat of white and hard rocks, about 40 feet high, in which appear large holes and breakings, with some prickly shrubs.

ALTAVELA, or the Little Mount, a high rocky islet, lies at the distance of five leagues south from Beata Point, in latitude 17° 28′ and longitude about 71° 23′. The islet is peaked, but its summit has a rotundity resembling the upper part of a bell. It is generally seen before any other land in the vicinity, particularly from the southward, and appears like a dome emerging above a mist or fog. Being very bold, it may be approached with safety.

At the distance of two and a half leagues N. N. E. from Altavela lies the south end of Beata Island. Between is a good and very deep channel. There cannot, however, be any motive for preferring a passage between these islands to passing southward of Altavela; and therefore vessels bound to the westward from Ocoa Bay, may steer S. S. W. 22½ leagues, and a west course will then lead well to the southward of Altavela; a more southerly course is, however, to be preferred, in order to avoid d anger should the wind become scant, with a westerly or W. by N. current, which has often been found to prevail here with considerable strength.

POINT AGUJAS, or the False Cape, bears from Beata Point W. N. W. ½ W. 6 leagues, and from the Frayles N. W. by N. 3 leagues. Cape Lopez bears N., true, 5 miles from Point Agujas. The coast between forms a bay, affording good anchorage. From Cape Lopez, Cape Roxo bears N. by W., 2½ leagues, and between is the Ensenada sin Fondo, or Bottomless Bay; from this bay the coast trends to the N. W., and at 5 leagues from Cape Roxo is the mouth of the Rio de Pedernales, or Petre's Cove, which constituted the old limit between Hispaniola and Hayti. At this place is a good anchorage, which it is easy to take, a bank here extending along shore, and there is no risk in nearing the coast.

From Cape Lopez, the promontory called Morne Rouge, or Red Hill, bears N. W. 12 leagues. A league and a half to the eastward of Morne Rouge, is the village of Sale Trou, or Foul Hole, where there is a good anchorage for vessels drawing less than 16 feet: larger ships may anchor there, but they must lie farther out, where the ground is not so good.

From Morne Rouge the coast trenches in a little to the northward, then out again E. S. E. to the Anses a Pitres, or Pitre Cove. All the coast is clear, and may beapproached with great safety, as noticed above.

There is good anchorage at the Anses a Pitres, and of very easy access. At 2 miles from the shore the water is very deep. All the coast hereabout appears white, being chalky. You may anchor either before the plain of Anses a Pitres, or southward of a small cape before the mouth of a river, which is considerable enough to be easily distinguished. The water is smooth, and you will be well sheltered in 6 or 8 fathoms, good ground, or in 4 fathoms and better ground nearer shore.

From Morne Rouge the coast rounds to Cape Jaquemel, or Jacmel, which bears from the former W. S. W. ½ W., 29 miles. From Cape Jaquemel Cape Marchaud bears N. by E. ½ E., distant rather less than 2 miles.

In approaching Morne Rogue from Cape Jaquemel, it may be known by its white hummocks. The coast in the space between forms several little creeks, wherein small vessels may anchor; but in none of them will they be sheltered.

JAQUEMEL, OR JACMEL.—Between Cape Jaquemel and Cape Marchaud lies the Bay of Jaquemel, in the upper part of which there is anchorage for shipping of every class. The town of Jaquemel stands at the head of the bay, to the east of the River Guache, which has several mouths in the beach. This bay, which is 2 miles in depth, was surveyed by Captain Mackellar and the officers of the British ship Pique, in 1817; and from this survey it appears that in the middle of it no bottom could be found at 70 and 80 fathoms; but the bank around the coast, which is about 3 cables' in breadth, has from 20 to 3 fathoms, shoaling to the land. On this bank, upon the N. E. side of the bay, is a dangerous reef, nearly half a mile long, the outer edge of which is 3 cables' length from the shore. To the westward of this reef, and opposite the town, is the anchorage, having from 5 and 7 to 3, and in one spot 2½ fathoms. You may sail in with a remarkable white cliff, the last cliff on the western side, bearing from W. ½ N. to N. W. ¼ N., until the wharf, near the middle of the town, comes on with the eastern side of an old battery, bearing N. by E. ½ E., and with this mark on you luff up to the anchorage, which, at half a mile to the southward of the town, has the depths above mentioned.

Jaquemel Harbor may be distinguished at a distance, by the sudden cut off or drop of a hill, seen over another long hill at the upper part of the harbor. Running in towards that drop will lead directly to the entrance.

BAYENETTE.—From Cape Jaquemel Cape Bayenette lies nearly W. ½ S., distant 5 leagues. The latter may be known by the white hummocks and cliffs on its extremity. This cape forms the south side of a bay of the same name, which is open to the S. E. Its name, Bayenette, signifies clear bay, and is supposed to have been given from its great depth of water, and being entirely clear of shoals. This bay is unsheltered, but there is anchorage on the north side near the shore.

LA VACHE.—From Cape Bayenette to the east point of La Vache, the bearing and distance are W. S. W. ½ W., thirteen and a half leagues. The isle is three leagues long and about one broad; it is hilly, and at the distance of six or seven leagues, appears like an assemblage of small islands. The south side is bold, and along the north reef extends to the distance of a cable's length. From off the east point is a white shoal, connected with a reef, extending from an islet to the N. W., called La Folle, or the Fool's Rock.

From the Fool's Rock to the N. W. end of La Vache, there is a range of islets and shoals, among which are some narrow passages. On the north side of La Vache is a bay, called the Baie de Feret, where there is good anchorage, but it is accessible only to those who are well acquainted. The northernmost of the islets above mentioned, is Grosse Caye, called also Caye de l'Eau or Water Key, which is readily known by a great tuft of large trees. It is bold to, and at some distance from its north side there is good anchorage, in from 15 to 30 fathoms.

The western end of La Vache forms the east side of the entrance of the great bay, called Bay of the Cayes; and from its S. W. point, called Point Diamant, Point Abacou bears nearly W. by S. five miles. In mid-channel between, there is a depth of 25 fathoms, thence decreasing towards the island. From the S. W. point of the isle a white rocky spit extends to the south, having from 7 to 5 fathoms over it, at about two miles from shore.

Remarks on the Anchorages within La Vache, by Captain Mackellar, 1817.

"The N. W point of La Vache is in latitude 18° 5′ 12″ N., longitude by chronometer, &c. 73° 43′ 15″ W. Variation, 6° 20′ E. Ships coming from the westward, and intending to anchor here, ought to round Abacou Point, at a good mile off, as a reef stretches to the S. E. to nearly that distance from it. Having rounded this reef, there is nothing in the way, and you may steer for the N. W. point of La Vache. At half way between it and Abacou Point there are soundings in 15 fathoms, and the bottom thence shoalens gradually to the island. The best anchorage here is with the N. W. part of the island bearing E. N. E. in 5 fathoms; you will then be about three-quarters of a mile from the shore, on a white sandy bottom. The soundings all over this part are so

very regular, that you can hardly err in anchoring any where, so long as you keep the N. W. point of the island bearing to the northward of east. From the N. W. point to the S. W. point of the island the soundings are not so regular, and strangers ought not to come nearer than in 7 fathoms, especially near the S. W. point, for a reef stretches from it to the southward not less than two miles, having very foul ground with irregular soundings to upwards of a mile or more. Therefore, ships, coming from the eastward and intending to anchor, ought to keep Abacou Point bearing west until the west point of La Vache bears north. They may then haul in to the northward, and steer for the anchorage.

"About a mile to the eastward of the town of Aux Cayes, which stands to the north, there are three small white cliffs close to the sea side; and the mark I have generally run in and out by, is the easternmost cliff bearing north, and in a line with a small round hill on the highest land behind it; and anchoring with this mark nearly on the N. W. point of La Vache, bearing E. N. E. or N. E. by E.

"The whole of this large bay to the westward of La Vache is clear, and the soundings very regular while you keep the west end of the island bearing to the northward of east. To the northward of this I had no opportunity of sounding, although I am well aware that between La Vache and Aux Cayes, the bay is covered with large reefs, and several are above water."

THE CAYES, ST. LOUIS, &c.—Point Abacou is composed of two points or reefs, which stretch three-quarters of a mile to seaward; but you may pass without fear, at the distance of half a league, and will find no ground with a line of 40 fathoms. The town of the Cayes bears from Abacou Point nearly north, four leagues. In sailing towards this place, and approaching Point Diamant, before noticed, you will not find the white ground for more than a quarter of a league from it; and the ground is good in 6 or 7 fathoms. With Point Diamant bearing east there are soundings all across. There is good anchorage to the west of Diamant Point, and farther to the northward opposite a sandy cove, in from 6 to 7 fathoms, bottom of mud and sand.

To go into Aux Cayes you range along the N. W. point of La Vache, in 6 fathoms water; and you steer nearly N. by E. to make, on your starboard hand, the white hummocks of Cavaillon. You will then leave on the larboard hand a large reef, surrounded with a white shoal, which takes up almost all the middle of the bay. When you have brought the town to bear N. W. ¼ W., you must haul up two points to windward of the town, standing towards the Company's Islet, where you may anchor if you do not mean to go into the road; if you do you shorten sail a mile from the shore, and wait for a pilot. The channel is two-thirds of a cable in breadth. Ships drawing more than 13 feet water cannot go in; those of 15 and 17 feet water always anchor at Chateaudin, half a league to the westward, and which is separated by shoals from the port.

To anchor in the road of Chateaudin, (coming from the mooring of La Vache,) W. or W. N. W. off Diamant Point, in 8 or 11 fathoms, you must steer directly for Torbec, which is a small town very easily distinguished, in the cod of the bay; this tack will be about N. W. When you are within about two miles of the shore, you will discover a little white flag, which is on a shoal; you double it to the westward at about half a cable's length, leaving it on the starboard hand; when you have brought it to bear south, you steer along the coast for the road of Chateaudin, and anchor in 6 or 7 fathoms, mud. In all this passage, if you keep the proper channel, you cannot have less than from 7 to 9 fathoms, and often 12 and 16, muddy ground.

In advancing towards the Tapion of Cavaillon, you must not approach too near its S. E. side, as a shoal of only 6 feet water, called Le Mouton, or the Sheep, lies S. E. from the eastern point, at the distance of about half a mile. There is a depth of 8 fathoms between it and the coast.

CAVAILLON BAY is spacious, although its anchorage is of small extent. The coast on the western side is very steep, and the bottom full of rocks; but there is anchoring ground on the eastern side, opposite a coast covered with mangroves, which may be approached without fear, the bottom being clean, with 5 fathoms close to the shore.

This bay affords shelter from the sea breezes, by the eastern point of an island, which leaves a passage into the Baie des Flamands, next described.

Baie des Flamands, or Flamingo Bay, lies a quarter of a league from Cavaillon Bay, and extends upwards towards the N. E. Its entrance and shores are clear and bold, and it is the place where ships lie up in the hurricane months. There is a good careening place, and anchorage in every part.

BAIE DU MESLE.—From Flamingo Bay the coast extends E. by N. two miles to the Grand Baie du Mesle, all over which the anchorage is good; but as the entrance is broad and open to the southward, there is no shelter from southerly winds. The coast hence continues its direction to Point Pascal, half way towards which is the Petite Baie du Mesle, in which a vessel may anchor, but it will not be sheltered even from the sea-breeze.

Off the Great Bay du Mesle is a shoal, lying like a bar across the bay, and extending

opposite the point, which is to the westward of the Little Bay du Mesle. This bank has not, in some places, more than from 15 to 18 feet water; it is very narrow, and leaves a passage of three-quarters of a mile only between it and the coast. To the southward it extends about half a league from shore.

To go into the Great Bay, with a ship drawing more than 15 feet, you must keep close to the shore on the western side, steering by Pointe Paulin, which forms that side of the entrance.

BAY OF ST. LOUIS.—The great entrance of the Bay of St. Louis lies between Point Pascal, which is steep and wide, and a little isle called Orange Key: the bearing and distance from one to the other being E. ½ N., rather more than half a league. This isle may be seen from the entrance of the Cayes, thirteen miles distant, whence it appears nearly in a line with the southern extremities of the intermediate coast.

About two-thirds of a mile N. E. by N. from Pascal Point is the Vigie or Old Look-out Point; between is a cove, called the Baie du Paradis. When off the Vigie Point you will have the whole of the Bay of St. Louis in sight. The bay is shut in on the eastern side by Cape Bonite, which bears from the Vigie Point, N. E. ½ E., distant one mile and three-quarters.

In proceeding to the anchorage of the Bay of St. Louis, run along past Point Pascal and Point Vigie, and thence along the western coast of the bay, in 8 or 10 fathoms water. The anchorage is west of the Old Fort,* about a quarter of a mile from the western shore, and so situated that the town may be seen from it, between the Old Fort and shore, in the bottom of the bay.

In the anchorage before the town, called the Little Anchorage, the greatest depth is 5 fathoms.

S. S. E. three-quarters of a mile from the Old Fort, and west of Cape Bonite, at nearly the same distance, is a shoal called Le Mouton, (The Sheep.) There is a good passage between it and the shore, as well as between it and the Old Fort; but the depth of water is less on the eastern than on the western side of the bay.

Between Orange Key and the shore, in a N. E. direction, there are two islets and some shoal ground; the first of which, next to Orange Key, is called Rat's Key. You may pass into the Bay of St. Louis through a small passage immediately on the north side of this Key.

AQUIN BAY.—One mile and a half E. by N. from Orange Key, is Moustique Key, a little island clear of shoals, unless very close in shore. You may pass without or within it, at the distance of one-eighth of a league, in 10 fathoms. Cape St. George is north of Moustique Key, and N. W. of a key called Caye a Ramiers, (or Pigeon's Key,) which bears E. by N., two miles from Moustique Key, and is known by a white hummock, rather steep, and seen at some distance. There is a deep passage between it and Moustique Bay, by which ships pass into the great Bay of Aquin.

South of Caye a Ramiers is a shoal, extending half a league, which has, on its middle part, only 3 fathoms. East of the same key is a small isle, called L'Anguille, or the Eel, and to the N. E. is another, called Le Ragale; the three form an equi-lateral triangle, having each side half a league in length.

E. N. E., three-quarters of a league from Caye a Ramiers, lies the west end of the Great Key of Aquin, which is two miles in length, and distinguished by two very remarkable white hummocks. It extends E. and E. by N., true, and its south side is bold to: but the white shoals of L'Anguille extend to its western point, so as to prevent a passage between it and Caye a Ramiers, for ships that draw more than 12 or 14 feet.

East of Aquin Key, at the distance of a short quarter of a league is a white insulated rock, called Le Diamant, or the Diamond; to the eastward of this, at the distance of two cables' length, is the Point of Morne Rouge, or Red Hill. Thus the eastern end of Aquin, the Diamond Rock, and the point of Morne Rouge, form the two passages into the bay. All the islands and shores are bold. In the Morne Rouge Passage are 5 and 6 fathoms water, and in that between Aquin Key and the Diamond, 6, 7, and 8. The bay is extensive, and trenches considerably inland, but the water is shallow, and there are only 3 fathoms at a distance from shore.

The point of Morne Rouge may be readily known at a distance, by three very high white hummocks, called the Tapions of Aquin, which together form a great cape, under which is an anchorage, in 10 and 12 fathoms, at a distance from land. This bottom continues as far as the Petite Baie des Flamands, or Little Flamingo Bay, which is W. N. W., a league and a quarter from the Tapions of Aquin.

To enter the passage into Aquin Bay, between Caye a Ramiers, and Mostique Key, before mentioned, steer N. N. E., so as to get into the mid-channel between the shore and the island. Having doubled Key a Ramiers, you will see La Ragale, which is a very ow isle of sand; leave this on the starboard side, keeping in mid-channel between it and

* The Old Fort is on an island of rocks towards the middle of the bay, half a mile to the southward of the town. In the passage between it and the shore, there is a depth of six fathoms.

the shore; then haul up for Aquin Key as much as the wind will permit, and anchor to the northward of it in 6 or 7 fathoms, or farther in, at pleasure.

GENERAL REMARKS.—Observe that from Point Pascal all the capes are broken and steep, and from the S. and S. E.; and as, on all this coast the land is white, many white hummocks will be seen. Aquin has two, above mentioned; but the easternmost and highest are those of Morne Rouge; and, with attention, it will be impossible to mistake them. From the point of Morne Rouge, or the hummocks of Aquin, the true direction of the coast, after having trenched in to form the Petite Baie des Flamands, is east, southerly, 10 leagues to Cape Bainet. The whole of this coast is free from danger and bold to, but has no bay or anchorage, or shelter from the common breeze. Two leagues and a half westward of Bainet the coast is iron bound, and the water near it of great depth.

POINT ABACOU TO CAPE TIBURON.—From Point Abacou to Point a Gravois, the bearing and distance are west, southerly, 2½ leagues. The latter is low, not easily distinguishable, and has frequently been mistaken for the land of Port Salut, a small cove lying a league farther to the N. N. W.

From Point Gravois, N. W. by N., 4 leagues, there is a bight of half a league, in which anchorage may be found. This bight lies about two miles to the southward of Les Coteaux. From this spot to a large hummock, called Les Chardoniers, which is very remarkable at a distance, the bearing and distance are nearly W. N. W., 10 miles.

From Les Chardoniers to the Fond des Anglois, or English Bottom, the coast extends W. by N., 4 miles, and a bay thence rounds to within a league and a half of Pointe de Vieux Boucan, or Boucan Point. All this part is safe, but it has no anchorage. A ship may, indeed, anchor very near the land, but it is every where exposed to the sea breeze.

From Boucan Point to Point Burgos, which is a low point, the coast trends westward, 4 miles. Between these places, off a point called Aigrettes Point, there are some white shoals, rocks, and breakers; but their extent is not more than half a league.

The Northern Coast of Hayti, or St. Domingo, between Cape Raphael and St. Nicholas' Mole.

[Variation generally about 5° E.]

CAPE RAPHAEL is of moderate height, and lies in or about lat. 19° 2′, and long. 68° 52′. It has already been described. From this cape to Cape Samana, the bearing and distance are N. W. ¼ W., nearly 7 leagues. Between the two is Samana Bay, about 10 leagues deep, so that you can scarcely see the land at the bottom of it; but what appears to the eye is very high double land.

CAPE SAMANA is a broken rugged point of land, which appears, from a great distance, like a ship with her topsails down, and seems not to join the main, but on a nearer approach, this shape changes. The cape makes with two points, both alike, bluff and steep, about the height of Beachy Head, in the English Channel, but not so white. They are 4 or 5 miles asunder, with a small bay and harbor between them. At 2 or 3 miles to the westward of the westernmost point, there is very high land, which falls down to the water side, and is twice as high as Cape Samana.

SAMANA BAY.—There is good anchorage in Banistre, or Levantados Road, on the south side of the peninsula of Samana. In advancing for this place, observe that when Cape Samana bears N. W. by W., about a league, it appears like two points, the westernmost of which, as you come farther in, you should bring open with a white spot of sandy ground, which may, at first, be mistaken for one of the sand keys, although it is connected with the main shore. In order to ascertain the true point, observe that in coming about it, it will appear as if a small rock were lying off it, which, on a nearer approach, will be found to join to the land. The soundings are uncertain. Having well shot into the bay, you may have 10 fathoms, and then no ground in 20.

Or, being off Cape Samana, and intending for this port, sail S. S. W., 3 or 4 miles, along shore, (you may go within a mile, for it is bold to,) to Point Velandras, or Blue Point, which has two or three black rocks lying near it. When at the length of this point steer thence west about half a mile, and you will leave three keys, which are high and woody, a mile from you on your larboard side. With the westernmost of the three keys bearing S. S. W., you may anchor in 15 fathoms, half a mile from shore, and have good water. Then Levantados, or Banistre Key, will bear W. by N., 1 mile off.

There is good easy riding in this harbor, in from 7 to 3 fathoms. You may also find good fresh water in many places, with plenty of fish and fowl. Here is commonly a fresh breeze from the eastward all day, and open to the north.

The preceding paragraphs are from the French of the Count Chastenet de Puysegur, &c. The following from the Spanish Derrotero.

SAMANA BAY.—From Cape Raphael the coast trends nearly west, and forms a gulf, shut in to the N. W. by the peninsula of Samana. The east point of this penin-

sula, named Cape Samana, lies 7 leagues N. W. by W. ½ W. from Cape Raphael. This bay, which is more than 11 leagues in extent, from east to west, and 4 from north to south, is obstructed and almost shut up by a great reef, which extends from the south coast, and so far to the north, that a channel of only 3 miles in width remains between it and the peninsula of Samana. The northern extremity of this reef is marked by some keys or islets, the largest of which, called Cayo Levantados, must be left on the larboard hand on going into the bay. Within there are several anchorages, but little frequented, as there is scarcely any commerce here. The first anchorage is on the coast of the peninsula, and near the entrance of the bay; it is named the Carenero Chico, (or Little Carenage: to enter and anchor here, it is necessary to approach within half a mile of Point Velandras, which is the S. E. point of the peninsula, and to keep along the edge of the coast at this distance, until sheltered by Vinas Point, when you may anchor in 6 fathoms, taking care to keep half a mile from a key, named the Key of the Carenero Chico, which is at the west part of the road, and has, to the south of it, either four or five small islets. Behind this key, and between it and the coast, is the proper anchorage; but it is much narrowed by shoals, and must be entered by warping. Point Vinas is easily known, as it bears true north from the west part of Levantados Key. In the entrance there is nothing to be feared, because there is no danger but what may be well seen; and only inward from Point Vinas is there a shoal, having on it two feet of water: to keep clear of this shoal, bear in mind that it bears east, a long mile from Vinas Point. By following the coast, as we have directed, at the distance of half a mile, you will go safe from it; but, for greater certainty, keep something to starboard, when you will sound in 5 fathoms water; for, in the channel, between it and the coast, there are 6½ and 7 fathoms.

A league and a half to the west of the Carenero Chico, is the Puerto de Santa Barbara, or of Samana: the anchorage here is very narrow at the entrance, which is formed by a great reef, that runs out to the east from Point Escondido, the S. W. point of the harbor: and on this reef, rise several keys or islets, of which the outermost is named Tropezon; the second is the Greater Carenero; and the third, Cayo Escondido, is very near the Point Escondido, on the west. There is not only this reef at the entrance, for the north coast sends off two, which stretch far to the south, and form two bays: of these the first is called Aguada, or Watering Bay, and it has Point Gomero for the N. E. point of its entrance. The second roadstead lies between the two reefs. In Aguada Bay there is good anchorage, in 6 fathoms, clay; the second anchorage is very narrow, but has 7 fathoms water. To the west of these two reefs and roadsteads, lies the principal harbor and anchorage of Samana, with a depth of 5 and 6 fathoms, on clay, which is found to the south of the town. To enter this harbor it is necessary to run along the north coast, at half a cable's distance, and steer to the west; taking care neither to get nearer to, nor farther from Point Gomero, than half a cable; for you will thus run in mid-strait; and by keeping farther off, you would incur the risk of getting on the southern reefs, or, by coming nearer, get on those of Point Gomera, which lie out one-third of a cable. So soon as past Point Gomera, you may see a little rivulet in Aguada Bay; and then you ought to place the prow direct for the western extremity of Carenero Key, until Point Escondido, or its key, bears W. ½ S., when you may run about W. by N., towards the bottom of the harbor, and perfectly free from the northern reefs, and may anchor to the south of the town, in 5 or 6 fathoms water, upon clay. If you wish to anchor in Aguada Bay, you must run in, luffing up to the northward so soon as past Point Gomero, in order to anchor in the middle of it, and about S. ½ E. from the rivulet of Aguada.

From this anchorage the coast of the peninsula continues bold, and with roadsteads, in which there is nothing to fear, except the south winds, which, in their season, are often violent. Two leagues to the west of Samana lies Point Espanola, with an islet; and thence, in the interior of the bay, there is no establishment whatever. A large clay bank, in the interior of the bay, runs out more than two leagues.

From Espanola Point, in which you will be well to the west of the reef at the entrance of the bay, you should steer to the south for the Bay of Perlas, or of St. Lorenzo, in which there is no necessity to run far in; and it may suffice to anchor at its entrance, and about south of Arenas Point, which is the north point of this bay; for, although farther in there is sufficent depth, yet there are sand banks, on which you might easily get aground. To find this bay, it is better to make the land to the east than to the west; for the south coast of Samana, from Perlas Bay to the west, is very wild and unsafe, on account of the many islets along it. Steering from said Point Espanola, to the S. ½ E., you will fall to the east of the bay, and make a little town, named Savanna de la Mar, which affords anchorage for very small vessels: and thus, so soon as you discover Arenas Point, when crossing over, steer towards it, and you may approach within a cable's length of it.

The entrance of Samana Bay is effected with the regular breezes; but you can get out with the land breezes only, which blow by night.

Cape Samana is of considerable height, and steep down to the water's edge; on nearing it you may also discover Cape Cabron, which is N. W. from it, nearly 3 leagues: this is even more high and scarped, or steeper, than the former, and the coast between is green, and covered with large trees: on it there are some islets, and as it is foul, it should not be approached nearer than one league. From Cape Cabron the coast takes to the west, and forms a great bay, called Escocesa Bay; the coasts of this bay are low, and very foul, from which reason, and as there is neither town nor establishment in it to induce vessels to visit it, they ought to proceed direct from Cape Cabron to Cape Viejo François, or Old Cape François, which lies 15 leagues from it, W. N. W. ½ W. Old Cape François may be seen, in clear weather, at the distance of 10 leagues. It is known by a mountain inland, which may be seen at the distance of 15 leagues.

Directions for those sailing in from the Eastward.

Ships coming from the eastward towards the N. E. coast of Hayti, should, previous to their making the island, run down between the latitudes of 19° 20′ and 19° 50′, taking particular care not to pass either to the northward or southward of these latitudes. In this track they will make the land, either by Cape Cabron, or Old Cape François, and they will pass clear of the Silver Key Bank on the one side, and the current commonly setting towards Samana Bay on the other.

BAJO NAVIDAD.—The north point of this bank lies in long. 68° 46′ W., and lat. 20° 12′ N., and extends in a southerly direction about 25 miles; it is 12 miles wide in the centre, and has on it from 14 to 26 fathoms water, and is perfectly free of danger. Vessels bound to the north side of St. Domingo, can have an excellent opportunity of correcting their longitude by running for this bank, which is laid down from the recent surveys of Capt. R. Owen, R. N., and published by E. & G. W. Blunt, 1833.

In passing to the northward of Porto Rico, a lookout should be kept for a rock or shoal (if not more than one) which certainly exists there, although its exact situation is not yet known. This danger has been noticed, where it is stated that an American schooner struck upon it in 1817, in latitude about 20° N.; and we have since met with another notice which states that, "at 50 miles north from Porto Rico, Captain Baxter, in the brig Robert, struck on a rock, and remained several hours."

OLD CAPE FRANCOIS.—The point of the Old Cape is rather low, and stretches out in the form of the snout of a porpoise; at 5 or 6 leagues distant, to the N. N. W. of Cape Cabron, in a clear day, the Old Cape is seen making like an island, whose ends slope gradually into the sea. When you have made Cape Cabron, being 4 or 5 leagues to the north-westward of it, you must sail 13 or 14 leagues N. W. ½ W., and you will pass 5 leagues to the northward of the Old Cape; then steer W. by N., when, having run 15 leagues, you will see Point Casrouge at about 3 leagues distant from you; continue on for 5 leagues, when Ysabella or Isabella Point will bear S. W. ¼ W., distant 4 leagues; having advanced thus far, you have nothing to fear, and, if necessary, you may keep within half a league of the shore, the coast being very clear.

At about 4 leagues off to the northward of Old Cape François its point appears like a porpoise snout, projecting to the eastward; and 3 leagues farther west is a point named Cabo de la Roca, or Rocky Cape, very much resembling it, and projecting to the westward. The coast between lies W. ½ N. and E. ½ S.; it is low, rather steep to the sea side, and covered with trees remarkably green.

Towards the point of the Old Cape a mountain is perceived inland, which, in clear weather, can be seen 15 leagues off, and is a good mark to point it out.

There is some foul ground laying off the pitch of the cape, and a harbor a little to the westward of it for small vessels. When sailing from Cape Samana to Old Cape François, which is about 6 or 7 hours sail, you see a point of land on the east side of the cape, which oftentimes, at first sight, you suppose to be the cape, but coming nearer you will see your mistake. And when you are due north of Old Cape François, you will perceive to the eastward of the cape a very steep point, which seems to be divided from the main, and running off the land rises higher and higher in such a manner that the highest part of it lies open to the sea, so high that you cannot see the land within.

When from Old Cape François you sail for Monte Christi, observe to steer a more northerly course in hauling off, giving a good distance between you and the shore, because the currents always set upon it; and unless you do this you will run the hazard of being ashore.

From Cape de la Roca, the land trenches in to the distance of 2 leagues, and forms a bay pretty deep, which is sheltered by reefs. This coast trends to the W. N. W., and rising in height to the northward, comes to Punta Macuris, or Point Mascury, which bears W. ½ N. from Cape de la Roca. This point is high, and its shore bold: it serves as a mark for the small harbor of St. Jago, which is 3 leagues distant from, and to the eastward of Puerta de Plata.

PUERTO DE PLATA, or Port Plata, lies 17 leagues from the point of the Old Cape, and bears from it west. It is known by a mountain at some distance inland, which

appears insulated like the Grange, although not in so precise a manner. This mountain, which is called Isabella de Torre, has a large white place on it, caused by a slide, in the great rains of 1837 and 1838. This is a good mark for the port, and you must run for it, until you discover the fort at the foot of the mountain. The anchorage is good, and the entrance nearly covered with mangrove islets, which you range along, leaving them on your larboard hand; when you are within these islets, you anchor in 17 to 20 fathoms, good bottom. Observe, when sailing in, to keep close to that point of land on your larboard side, which you will see to be broken and rugged. When coming about the said point, luff up round and run up as far as you can, with your sails almost shivering in the wind; thus you will gain the best place in the road.

On approaching the coast, you will descry to the westward a great cape, very high and steep; the extremity of this is Punta del Algarroba, or Point Casrouge, which is readily known by its magnitude.

The bight from Port Plata to Point Casrouge is bordered with reefs close to the shore, and does not admit of any anchorage.

Old Cape François and the Great Point of Algarroba, or Casrouge, bear from each other W. ½ N. and E. ½ S., 19½ leagues. When at the distance of about 3 leagues to the northward of Casrouge, you will see a low point projecting out to the westward, which is remarkable by its having the appearance of being detached from the coast like an island: it is Ysabella, or Isabella Point, the northernmost point of Hayti.

YSABELLA, OR ISABELLA POINT, according to the late observations, lies in latitude 19° 59′, longitude 71° 10′ 30″, and at the distance of 4½ leagues W. N. W. ½ W. from Algarroba, or Casrouge Point. To the eastward of it lies the deep bight, called Puerto Caballo, Port Cavallo. In the bight between these is an anchorage for vessels drawing 12 or 13 feet water, and sheltered by the reefs: the entrance is readily known by running to it along the reefs.

On the western side of Isabella Point is a more extensive anchorage, and more easy to gain than that of the east, but the ground in many places is foul: there is a depth of from 5 to 7 fathoms water.

From Isabella Point to the Grange, the bearing and distance are W. S. W. ¾ W., 10 leagues. The coast between is bordered with reefs, among which the entrances are narrow and dangerous.

West of Isabella Point is Punta Rucia, or Rocky Point, to the westward of which is an anchorage for large vessels, which, being very bad, ought to be used only in case of necessity.

To gain this anchorage, you must haul very close to Rocky Point, and anchor so soon as you are in 12 fathoms, white bottom.

This anchorage, which is sheltered by the reefs that stretch N. N. W. from Punta Rucia, lies about 4 leagues from Isabella Point.

THE GRANGE.—The Grange Point is known by the mountain of that name, and is seen at a great distance before you perceive the sea coast. This mountain, which is insulated, and stands upon a low peninsula, has very much the appearance of the roof of a barn, from which it takes its name Grange. The north-west part of it is bold, and you may approach it within a quarter of a league, or even less. Close to the west part of the Grange Point is a rocky islet, named the Frayle, or Friar; and from its S. W. part, at 3 cables' length, is another, somewhat larger, and named Cabras, or Goat's Islet. These are the islets of Monte Christi.

HAUT-FOND.—Two leagues to the N. N. E. of the Grange Point lies a white shoal, of not more than 2 cables' length each way, called the Haut-fond; there is a small spot on the shoal, with only 25 feet of water, on which the Ville de Paris struck in 1781. Close to it is a depth of 6 fathoms, then 10 and 15, and suddenly no ground. The white ground has generally scattered rocks, so that it cannot be ascertained whether there may not be some spots on it even with less than 25 feet. When you are on this shoal, the Grange bears S. by W. ½ W.; you will then have the islets of Monte Christi open of each other, the westernmost of them bearing S. S. W. ¼ W.

MONTE CHRISTI REEF.—About 3 leagues to the westward of Haut-fond lies another reef, on which the British ship Torbay struck and lost her rudder, in 1783. It extends nearly N. E. and S. W., is about three-quarters of a mile in length, and half a mile broad. On the shoalest part the points of rocks stand up like sharp spires. On other parts were seen white patches of sand. The shoalest water, 3 fathoms; thence 3 to 4, 5, 6, and 7 fathoms. It is steep to, and has from 15 to 17 fathoms close to it, and 20 to 25 all around. The bottom is soft in 20 fathoms; and in some places you will have coarse sand. The water, when smooth, is very clear, so that you may see the pinnacles of the rocks as you pass over them in a boat. From the shoal, in 3 fathoms, the eastern end of a grove of trees, open to the south-westward of Monte Christi, (and between it and the key,) bore S. E., and the Mount of Cape François (now Cape Haytien) S. W. by W. The variation at the same time was 6° 20′ E.

With Isabella Point bearing S. W., distant 4 leagues, the course and distance, to pass

without the shoals called the Haut-fond and Monte Christi Reef, will be a few degrees to the northward of west, 17 leagues; and then the latter will bear about S. E. But should you be up with Isabella Point, and prefer the mid-channel between these shoals and the coast, a W. by S. course, 16 leagues, will clear the shoals, and bring you in sight of the high land of Cape Haytien, (formerly Cape François,) at the distance of about 5 leagues.

In sailing between Old Cape François and the Grange, be careful to keep sufficiently to the northward in hauling off, that you may not be driven ashore by the current, which always sets upon the coast.

There is anchorage under the Grange to the west: to take it, you must range along the Frayle, or Islet of Monte Christi, and let go your anchor so soon as you have 6 fathoms; but under the south side of Cabras, the westernmost islet, you may anchor farther in, with 4 fathoms. From the Grange you may see the mountains above Cape Haytien.

In approaching this anchorage you must be cautious of a shoal, which lies W. by S, from Cabras Isle, at the distance of a long mile: to keep clear of it, on entering and leaving the anchorage, take care not to bring Cabras Isle to bear any thing to the northward of E. ½ N., but, on the contrary, keep it rather to the southward of that bearing.

The Shoal or Bank of Monte Christi extends 14 miles to the west, and to the south as far as Manzanilla, or Manchioneal Point; and it thence continues to border the coast at the distance of half a mile, more or less, according to its sinuosities. On this bank rise the islets named the Seven Brothers, which are low, and covered with mangroves. The islet named Monte Grande is the most remarkable of all of them: it is the second from the eastward, and has high trees upon it. This bank, as well as many others in these seas, has a very white bottom, and is very dangerous, because the bottom is very irregular in its depth, with stones and rocks; you may have 8, and immediately after 3 fathoms. You should therefore avoid sailing on this or similar banks, unless they have been well examined and sounded.

MANZANILLA BAY, &c.—To the east of Manzanilla Point there is an excellent anchorage in Manzanilla Bay; from this bay the coast trends in to the S. E., and then turns to the west, in which direction it continues to a distance of 8 leagues, when it ascends to the north, and terminates with Point Picolet. The Grange Point with Point Picolet form a great bay, in which, besides Manzanilla Bay, there are two harbors; the first of these, named Bayaha, or Port Dauphin, is to the S. W. of Manzanilla Point, and about 2 leagues from it; and the second, at the western extremity of the bay, is known as Guarico, or the City of Cape Haytien, or City of the Cape.

The coast from Bayaha to the west is bounded by a white bank and reef, on the edge of which there are from 50 to 80 fathoms: between the reef and the coast is a channel, with 2 or 3 fathoms of water, to which there are various passes in the reef, known to the coasters and pilots only.

The navigation from Grange Point to Manzanilla Point should be made on the white bank of the Seven Brothers; it is, therefore, very necessary to know the channel; and though you may proceed on the outside of the islets and the bank, extending to the westward, it follows that, in doing this, vessels must get much to leeward, and are then obliged to beat up to the anchorage. The delay in following this route is not so great when bound to Bayaha, or Port Dauphin; but the channel for crossing the bank, which we are about to describe, being very safe, it does not seem requisite that any one should go round about, but that all should proceed as follows:

Having passed near the Grange Point, steer W. ½ S., without going to the southward of that bearing until you are to the north, or on the meridian of Yuna Point;* the vessel, having arrived at this situation, should now steer towards Yuna Point, until the islet named Monte Chico, which is the easternmost of the Seven Brothers, bears west; whence you must steer S. W., leaving to starboard the Islet or Key Tororu, which is the southernmost of the Seven Brothers; and when you mark it at about N. by E., you must steer S. ½ E. until you have Manzanilla Point E. ½ N., when you must haul to the wind on the larboard tack to take the anchorage, if you can; and if not, you must prolong the stretch to the southward as far as necessary, to enable you to get into the bay upon the other tack, in the understanding that you may run along the whole of the south shore at half a mile, or even less. In running by the way we have pointed out, you will find upon the bank 7 to 8 fathoms of water, on sandy clay, and you may anchor on any part of it commodiously, especially to the S. W. of the eastern keys, Monte Chico, and Tororu; and it may even be convenient to anchor in case of night coming on, by which the inconveniences arising from darkness may be avoided.

The edge of this bank is so steep that from 12 to 20 fathoms you rapidly pass into 100 fathoms: and of the same nature is Manzanilla Bay; for from 7 fathoms you pass to 100 in the short distance of 5 cables' length; from which reason an anchor should never be

* Yuna Point is a low point, which bears S. W., true, 5 miles, from Grange Point.

let go until the depth has been previously ascertained by the lead, keeping in mind that the best anchorage is in from 6 to 10 fathoms, on a stiff clay bottom, which the anchors catch well, and at less than half a mile from the shore.

In the River Tapion, (E. S. E. of Manzanilla Bay,) and also in that of Axabon, to the S. E., water may be conveniently got, and you may cut wood on any part of the coast that is desert and uncultivated. In this bay there are always fresh land breezes, which facilitate much the communication between Bayaha and Monte Christi; for those to whom the breeze is contrary, navigate at night by aid of the land breeze. In Manzanilla Bay no hurricanes are felt, which is an advantage of great consideration.

THE HARBOR OF BAYAHA, OR PORT DAUPHIN, is one of the finest ports in Hayti; for to its great extent it adds shelter equal to a dock, with an excellent clay bottom, and the depth does not exceed 12 fathoms, nor is it less than 5 fathoms, which are found at half a cable from the shore; but notwithstanding these singular qualities, if the difficulty of entering and getting out of it, in consequence of the narrowness and foulness of the channel or mouth, is considered, it will be seen that it would not answer for any vessel on actual service to enter and be shut up in a harbor from which she could not sail, unless at night, with the land breeze, and thus exposing herself not only to the danger of getting aground on the shoals of the entrance, but also, in case of the land breeze failing, she may both lose the time for getting out and the object for doing so. The interior of this harbor needs no description more than the chart, by which it may be seen that its entrance is only a cable and two-thirds in width; and this narrow breadth continues inwards to the distance of a short mile. The several points which are in this passage render the entry still more difficult. The risk of this consists in a shallow ridge which borders both sides of the channel; and which, at the points, stretches out more than half a cable, and reduces the channel to one cable's length in width. Again, this channel being serpentine, it is necessary that a vessel, in running in, should take the turns with much dexterity and promptitude, in order to avoid getting aground. It is, therefore, necessary to enter this harbor when the breeze is to the northward of E. N. E.; for, if more scant, an attempt to take the entrance will be impracticable. Keeping well in the middle of the channel, you pass close to the White Shoal, which runs out from the windward point of it: and, when abreast of it, you must luff up so as to place the prow towards the second point on the windward side, so as to free yourself from the ledge which lies off the second point to leeward; and so soon as you have this abeam, on the larboard side, you must luff up for the last point to windward, till you have passed the third leeward point, when you may run in and anchor between Port Dauphin and the little isle, called Tonantes Island, without approaching near the N. E. part of the latter, because a shallow bank stretches off it. From what has been said, it may be seen that the harbor requires no other direction than that of an eye accustomed to run in mid-channel through a devious passage; and he who knows how to do this, need never get ashore here; for his eyes will direct him when to luff and when to bear away, without particular leading marks. From the mouth to the third leeward point you cannot anchor, from want of space to turn the vessel, and because the bottom is of sharp rocks. The tide, at full and change of the moon, flows here at 7h. A. M., and spring tides rise 5½ feet, but neaps only 3½ feet.

THE HARBOR OF GUARICO, OR CAPE HAYTIEN, is no more than a bay, formed by the coast, and shut to the east and north by a group of reefs which rise upon the White Bank, extending outward, at this place, more than a league. Those bound to this port ought to run from the Grange Point towards Picolet Point, outside the Seven Brothers, and to place themselves so that they may run down towards Point Picolet, with the vessel's head to the S., or S. S. W. In this direction they may approach without fear, within the distance of a musket shot, and may wait for a pilot, as convenient; but, if obliged to take the anchorage without one, they must steer from Point Picolet S. E. and S. E. by E., leaving a white flag, (if there,) on the larboard hand; and which, placed upon the northern extremity of a reef, serves for a beacon, taking care to carry plenty of sail to clear a red flag, which they will see a little afterwards, and which must be left half a cable's length to the starboard; and so soon as they have this flag on their beam, they may steer for the city, and anchor in from 7 to 9 fathoms.

Those who go out from Manzanilla, or Bayaha, (Port Dauphin,) to the cape, ought to steer to the northward until Picolet Point bears to the southward of the true west, and then direct their course to the west, as convenient; for they will be clear of the white bank off Point Picolet; but if bound to the east, they must run to the northward until the Grange Point bears to the southward of the true east, in order to clear the Seven Brothers' Bank.

The Count Chastenet de Puysegur, in his directions for the coast of Hayti, gives the following for Cape Haytien, &c. These were written in 1787, but they include some descriptions not given in the Derrotero, and we therefore insert them here, with a trifling correction.

"Ships bound from the eastward to Cape François, always make the Grange; for the

coast, in the environs of the cape, offers nothing remarkable, unless they be near enough to distinguish the hummock of Picolet, and the rock of that name, lying to the north, and very near the hummock. Having brought Monte Christi to the south, distant about a league and a half, the proper course, in order to fall a little to the northward of Picolet Point, is between the W. S. W. and S. W. by W., distant 9 leagues.

"The mark is surer, when you approach the cape from the Grange, in steering W. S. W. and S. W. by W.; for, in this last position, the hummock of Picolet must appear to project in the sea more than the rest of the coast. The best mark that can be given is, that the hummocks which are to the west of the road of the cape, are the highest of all this part; besides, you can distinguish in them large white spots. With some attention you will discover Point Picolet, which is lower than the said hummocks, and seems to lose itself among them. This point terminates the road of the cape on the west side; in coming near, you descry Fort Picolet itself, built upon the point, at whose end lies the rock of the same name, which is not discernible at a greater distance than a league.

"So soon as you have descried Fort Picolet, you steer directly against it, because you must sail very near that fort to enter the road, whose opening is bordered with dangers or keys, which you leave on the larboard in coming in. We would advise no stranger to attempt the channel without a pilot, for whom he must wait in the offing.

"At half-past ten the wind comes to the E. S. E., but it must blow from the N. E. to carry you into the harbor, for you are obliged to steer S. E., and even E. S. E. The breeze is very regular. The land wind blows in the evening, and often during the night; but, about 10 or 11 in the morning, after an interval or calm, it turns to the E. N. E., or N. E. So that at 12 o'clock, ships are able to enter the harbor.

"The city of Cape Haytien is under Picolet Mount. There is no danger in running in for Picolet Point, if you keep it bearing from S. S. W. to S. S. E. Should you not have time to wait for a pilot, you must range along Picolet Point, having it about S., or S. S. W., at the distance of a short musket shot.

"*To sail into the harbor*, bring Point Picolet to bear S. by W. ½ W., and steer S. ¾ W. A remarkable mountain, called the Bishop's Cap, will then be seen directly ahead: bring this mountain, which appears in three points, in a line with a remarkable hummock, by the water side, in the harbor, which will bear S. by W. Steering in this direction will lead to the westward of the outer reef, named Le Coque Veille. The water generally breaks on this reef, which has, (or had,) a buoy, or white flag upon it. Continue in the same direction, leaving the buoy at the distance of about 15 fathoms on the larboard side, until a small rock, standing detached a little from Picolet Point, appears just open of that point. Now haul to the S. E., or S. E. by S., keeping the rock just open, and you will pass between the Coque Veille and Le Grand Mouton Bank, a bank having a buoy, or flag, on its eastern edge, which is left on the starboard side. The Petit Mouton, a danger that always breaks, and a shoal, named Trompeuse, with a buoy, or white flag on it, are to be left on the larboard side. You must, therefore, have sufficient sail out to weather round the Grand Mouton Bank, giving the buoy, or flag upon it, a berth of half or two-thirds of a cable's length; and having passed it, steer for the town, and you may anchor where you please, in 8 or 9 fathoms, good ground.

"A ship cannot enter the harbor unless the wind be at N. E., as she is obliged to steer S. E. by S., and even S. S. E. The breezes are very regular; they come from the land in the evening, and very often during night; but, at about ten or eleven in the morning, after an interval of calm, they chop about E. N. E., or N. E. Strong norths heave a great swell into the bay."

The town is on the western side, about 2 miles from Point Picolet, in lat. 19° 46′ 20″, long. 72° 14′.

PORT FRANCOIS.—From Point Picolet the coast trends west to Honorat Point, which is the north point of Port François, whence a reef stretches out a cable's length to the N. W. At its extremity are 3 fathoms of water. The anchorage off Port François is in a small bay, and about two cables' in extent. Between the points of the bay there is good shelter from the breezes. To enter, you must run along the edge of the reef of Honorat, which is on the north side; and after having gone about two cables to the S. S. E., you may anchor in 8 or 10 fathoms, on clayey sand, about S. W. by W. from the fort.

BAY OF ACUL.—From the south point of Port François, a reef extends as far as the entrance of the Bay of Acul, without leaving any practicable pass. The Bay of Acul is extensive. It has three entrances, but the western is the best; the eastern being narrow and devious. The first entrance is between Rat Islet and Sandy Islet, situated on the reefs extending from Port François, and which shut in the entrance to the N. and N. E. That to the N. W. is shut in by other reefs and shoals, which, though among themselves they have only difficult and narrow passages, form an excellent channel with the west coast of the bay. The three channels into the harbor are called the East, the Middle, and the West, or Limbe Channels. To enter any one of these chan-

nels, it is necessary to approach on the outside of the White Bank, extending along shore between Port François and the Bay of Acul, until Rat Islet bears S. by W. ½ W., and so soon as you are a league from the Sandy Islet, you will plainly see Trois Maries' Point, which is the eastern point of the bay; and approaching nearer, you will also see a low point on the western side, in the interior of the bay, named Point Belie, which is known by a clump of trees that is upon it. Having recognized these points, bring them in a line, and steer in with this mark, keeping by small variations of course, the depth of 10 fathoms. Thus, you will run in mid-channel, which is not more than a cable's length wide, and the bottom of clay. On both sides of it there are white banks, with 4 fathoms of water on their edges. It is necessary to notice that you must have recognized the two points which serve for the leading mark at two miles from Trois Maries' Point; for, from that distance, it is necessary to come in by the mark described. In thick or hazy weather, when these objects cannot be seen at the proper distance, you must not attempt to enter by this channel. At about four cables' length within, the channel begins to widen, so that when Rat's Islet, which you leave to the starboard, bears N. W., you may anchor in from 14 to 18 fathoms. All the reefs which lie within Rat Island are visible.

To enter by the Middle Channel, you must run outside the bank until Rat Islet bears S. by E. ½ E., and placing the prow in that direction, steering that course, and keeping in 9 fathoms of water, you will pass very near to some reefs which are about one-quarter of a league to the northward of Rat Islet. These are easily seen, and it is necessary to approach them within a cable's length on the larboard hand, and to luff up to S. E., or S. E. by E., to pass along the north side of that which stretches to the east from Rat Islet, and which must be left to starboard. Having once got to the S. E. of Rat Islet, you may anchor as above stated. All the reefs show clearly, and therefore there is no danger in taking this channel when the winds allow you to shape the proper courses; but, if you cannot do this, you ought not to take it, as there is not room for working in. In case the wind becomes scant in the channel, you must anchor in a moment, and you will be free from danger; for the holding ground is very good, being hard clay, and you are sheltered from the swell of the sea.

The West, or Limbe Channel, is the best and widest, for you may work in it, if requisite. To enter by this channel, run outside the banks or shoals, until Point Icague, on the west side, bears south. This point lies between Limbe and Grand Boucand Points. That of Limbe is the north-westernmost, and has an islet at its base.

Point Icague is easily known by the scarped or bluff rocks which form it; and from its being the only one of any elevation lying to the south of Limbe. So soon as Point Icague bears south, steer towards it, and as you get near it you will see, to larboard, the breaking of a reef of considerable extent, named Coqueveille, on the edge of which there are 5 fathoms of water; having recognized this reef, taking care to pass in mid-channel between it and Point Icague, in 10 or 15 fathoms of water, and with nearly a S. E. course, with which you must run in, amending successively a little to the east, to pass about 3 or 4 cables' length from Grand Boucand Point. You may then anchor to the west of Trois Maries' Point. If obliged to tack, you must prolong the tacks until very near the reefs, on the supposition that their breakers afford the best marks for avoiding them; and that, at the very edge of them, there are 5 and 6 fathoms of water. You may also prolong the tacks to a cable from the coast, without any risk; for, though Boucand Point is foul, the reefs show above water, and have 8 and 10 fathoms up and down at their edge. The anchorage, or place which we have assigned for anchoring, between Rat Islet, Trois Maries' Point, and Boucand Point, is not properly that which is called the Bay of Acul; but, as there is good shelter in it, those who have no occasion to make a long delay, or to discharge, may avoid entering the bay.

To enter the Bay of Acul, you must not approach Trois Maries' Point nearer than three cables' length, for it is foul and shallow; and so soon as you are past it, steer towards the point of Morne Rouge, (Red Hill,) on the east, which you may pass at about half a cable's length, in order to give a berth to a shoal which lies off Belie Point, opposite. Having passed Morne Rouge Point, you will see a fine cove, on the same side, called the Lombard Cove, in which you may anchor in 7 fathoms water, at about a cable's length from the shore. From this cove, southward, into the interior of the bay, there are many shoals; and no one should pass the cove who has not a practical knowledge of them. In the route above described, you will always find from 10 to 15 fathoms of water, on clay.

Between Trois Maries' Point and that of Morne Rouge, in a line with them, and about half a mile from the first, there is a shoal of small extent, which you will shun by taking care to pass at not less than three cables' length from Trois Maries' Point, and not to place the ship's head towards Morne Rouge Point until you are at half the distance between the two points. The anchorage of the Lombard Cove is a natural rock. In Acul Bay it is difficult to get water; the best is on the eastern side of the cove, between Trois Maries' and Morne Rouge Points.

ANSE A CHOUCHOU, OR CHOUCHOU BAY.—To Point Limbe follows that of Margot, which has a round islet, lying rather farther out than that of Limbe. It is very useful to make this islet, in order to direct yourself to Chouchou Bay, which lies two miles west from it. In this bay there is a good depth of 6 or 7 fathoms: to enter it you must keep towards the east point, which has 6 fathoms close to it; and so soon as you have passed it, and the vessel begins to lose headway, you may anchor; for the moment you enter under the point the breeze calms, and the little you have comes ahead. This happens even when the wind is very fresh without the bay. To the west of this bay, there is a small one, called La Rivière Salée, or Salt River Cove, which has little depth, and is fit for small craft only.

FOND LA GRANGE.—Four miles westward from the Bay of Chouchou is that of Fond la Grange, or the Grange Bottom, 600 fathoms broad; and the west point of which, named Palmiste, is distinguished by a chain of reefs extending nearly a league to the west, and almost to Point d'Icague. Fond la Grange is a good roadstead, and in case of necessity, a ship of the line may ride in it; for, throughout it, there are not less than 6 fathoms water, and at less than a cable's length from the shore. To enter in it, you must pass near the east point, and anchor in about the middle of the bay, on clayey sand. At a short league westward from Palmiste Point lies that of Icague. The coast between is foul, with sunken reefs, which advance half a league out to sea.

PORT PAIX.—Eight miles from Point d'Icague is that of the Carenage, which is the northernmost headland of this part of the coast, and which, from a distance, may be mistaken for Point d'Icague. The coast between is very clear. From this point the coast trends S. W. by S. to form the cove of Point Paix. To enter here you must avoid the east shore, because from a point which lies a little to the N. E. of the town, a reef stretches out about a cable's length, and immediately without it there is a depth of 13 fathoms, with oozy sand. To avoid this reef, keep in the middle of the entrance, which has only three cables' length in breadth, and anchor to the N. W. from the town, in 12 or 13 fathoms, on clayey sand, about a cable and a half from the shore.

CHANNEL OF TORTUE.—Nearly north from Point d'Icague is the east point of Tortue or Tortugas Island, which extends nearly east and west, and, in that direction is about 6 leagues in extent, but only 1 from N. to S. All its north side is iron bound, and steep to, and the south side is for the most part bounded by a white shoal and reefs. The only good anchorage in Tortue is that of Basseterre, on its south side, at a league and a half from the east point. It is formed by the shore and the reefs which run out from it, and no vessel drawing more than 14 or 15 feet can enter it. The passage is narrow, but easy to fetch. You must keep the weather reefs on board, leaving them on the starboard hand, and steer N. N. W. and N. to double the reefs you leave on the larboard hand. Do not be afraid of coming near the land, and anchor in good ground so soon as you have brought the lee reef to bear S. W. Large ships may come to anchor outside the reef, upon white ground, a mile to leeward of Basseterre.

To the eastward of Basseterre, towards Portugal or the east point, there are several bays or coves, in which boats or schooners may anchor, but nothing of a larger size.

The channel which the Isle of Tortue forms with Hayti, is 6 miles wide, and fit for every class of vessels, which may commodiously beat in it, and often with great advantages for getting to windward, when the currents in it run to the eastward, which they do for the greater part of the year; for rarely, and only during souths, do they change their direction to west. In the latter case, it is necessary to advance northward, and get 6 or 7 leagues from the Tortue, to beat to windward. When beating in the Tortue Channel, you ought to sand on within less than a mile of the coast on every tack; for towards the coasts the current is stronger, and the wind more favorable, than in mid-channel. As there are several bays on each side, the setting of the current is neither uniform nor in the same direction. You will sometimes see it run in numerous directions; and sometimes, in the middle of the channel, it will run contrary to the current in shore.

PORT PAIX TO ST. NICOLAS' MOLE.—Four leagues from Port Paix lies Port Moustique. The coast between is clear, and bluff or scarped. Port Moustique has scarcely an opening of 4 cables' length: its bottom is unequal, and impeded with rocks, which render it necessary to examine it with the lead before you let go an anchor; for between the two outer points you cannot find bottom with 40 fathoms of line.

At a league and a half from Port Moustique is Port a l'Ecu, and the coast between the two is rocky, steep to, and bluff. This cove is better than Port Moustique, but not so easy for large ships, as its entrance is narrow, in consequence of a reef which stretches off about two cables' length from its eastern point, and upon which there are not more than 3 fathoms water. To take this anchorage, it is necessary to keep near to the reefs off the east point, and haul by the wind, ranging along the reef, to anchor in 8 or 10 fathoms in the centre of the cove, on clay, and about N. N. E. from a house which is at the bottom of the bay.

Six miles from Port a l'Ecu is the anchorage of Jean Rabel, which is good, safe, and easy to take. On approaching this place you ought, without any fear, to approximate

the reef on the east side, which has 10 fathoms close to its edge. The anchorage for large ships is about two cables' length from the eastern breakers, in 12 or 15 fathoms; and care must be taken not to shut in the two points which are on the east coast, for though it is possible to run farther in, yet it is not advisable; for the depth suddenly diminishes, and the bottom is not very clean.

Should you be to the north-west of Jean Rabel, at a short league's distance from the land, and half the island of Tortue open with the point, you will find 60 fathoms of water, oozy ground, and a little farther out 80 fathoms.

From Jean Rabel the coast forms a great bight to the southward, as far as the peninsula, called Presqu' Isle, or the Mole, the western point of which, called the Mole Point, lies 13 miles W. S. W. from it. All the shore between is rocky, and does not offer any shelter. At all times the currents here are very perceptible near the shore, and generally set on it. At two leagues in the offing they are less so, and run to the north-east. Near the peninsula they are much stonger, and commonly set towards the north.

ST. NICOLAS' MOLE, BAY OR HARBOR.—This harbor is large and spacious at its entrance, but narrows towards the town, which you will descry as soon as you have doubled the cape. You may stand very close to either shore, but it is advisable to allow on the south side more room for veering than on the north side, as there is no anchoring ground, which you have on the north side, though very near the shore. The anchorage is before the town, and under the barracks, in 15 or 18 fathoms, sandy bottom. In going in, you must be prepared against the puffs or squalls, which come down from the land with such violence as to endanger the masts.

Within the bay or harbor you will be sheltered from every wind. There is a fine river to water at, and places where a ship may be careened with her side to the shore. When it blows hard it is difficult to get to the anchorage; and if you are not quick in letting go, the anchor may fall from 6 to 30 and 35 fathoms.

The Derrotero says that the north coast from Cape St. Nicolas, sends out a white bank, which stretches about one-third of a cable from the shore, and on which there are 3 and 4 fathoms water. The south shore has also its white bank, which extends out about a cable's length from an interior point S. W. of the town, upon which there is a battery. From this point the white bank extends directly to the Fort Point, the N. E. end of the town: and, therefore, when to the northward of that point, you must not prolong the tack to the south farther than to bring the north part of the town to bear east. You should also be aware, that on the south coast, and a little to the west of the above mentioned point, no bottom has been found; therefore you ought to look out and tack in time. On the northern tack there is not so much danger; for it is possible to let go an anchor, although it must be done very near to the shore. In the anchorage, which is well sheltered from all winds, vessels pass the dangerous season of the hurricanes.

In going out you will see, to the southward, the point of the cape which forms its entrance; and farther to the southward you will then descry the Point du Cap a Foux, or of Fool's Cape. The latter lies 5½ miles to the southward of St. Nicolas Point; and the coast thence extends 2½ leagues more, nearly in the same direction, to the Point a la Perle, or Pearl Point.

The sea breeze at the Mole is from N. E. by N. It comes on at 8 in the morning, and blows very strong till 10 or 11 at night. The land breeze comes on moderately at S. E. It continues till 6 in the morning, then dies away, and it is calm till 8. If bound to the northward, ships generally weigh at 8 or 10 at night, when the sea breeze begins to slacken enough to run them out.

Directions for ships bound to Cape Haytien, &c., from the Westward.

In advancing from the westward towards Cape Haytien, give the N. E. part of Tortue Island a good berth: and after you get to windward of the east end of the island, you will descry the cape.

The land to the west of Port Paix shuts, to the northward, a low point, and rises gradually towards the south to a high mountain, with a sugar-loaf top, and then it declines on the same side to a large valley, whence it rises quickly to a prodigious high mountain, smooth at the top, and the highest land in this part of Hayti. The high land after this, to the southward, is of sugar-loaf form, with a little one to the south of it, which are both 10 or 12 miles in the country. The next high land, or point, which is seen by the water side, is Cape Haytien. The land, at first, makes like a saddle; but on nearer approach, a low point will appear, which shuts from the eastward the eastern part of the saddle-land. This is Point Picolet, or the Cape Land, the extremity of the cape already described.

MANZANILLA BAY.—Ships from the westward may with safety proceed to Manzanilla Bay. It is quite clear, and may be approached within one-third of a mile in every part of it.

The Seven Brothers, which have been described, are mostly barren, with reefs about

them. There is some wood upon them, and plenty of fish all round. You need not approach the western part of them nearer than two leagues, until you see the bay. On advancing into this, there will be found 10 fathoms water, at about three-quarters of a mile from shore.

The River Massacre, formerly a boundary of the Spanish and Haytien territories, falls into the bay, to the eastward of Port Dauphin; but it will be very difficult, if not impossible, to water there, as you must go up the river nearly two leagues to obtain it.

To anchor properly, so as to have the best shelter, run along the inside of Manzanilla Point, and drop in 6 fathoms, muddy bottom. All the anchoring places are within the Spanish line, where the land is low, marshy, and covered with mangroves. The bay is as easy to go in as to get out, having regular land and sea breezes, and being quite secure from any swell. A ship, having lost her anchors, may run in upon the muddy shore. The landing is very easy. Here are game and fish; and bullocks, cows, and hogs, may be purchased.

The ROAD OF MONTE CHRISTI is more open than Manzanilla Bay, although in it there is good anchorage; well sheltered from the N. E., E., and S. E., which are the strong breezes; and during the norths you may anchor in 5 or 4 fathoms, under Cabra, the islet of Monte Christi. The same resources may be found here as in Manzanilla Bay.

"The anchorage at the Grange," says an able navigator, "is less spacious than that under Point Ysabella, but it is more sheltered from the norths by the islet. Ten ships of war might easily be anchored, in from 5 to 7 fathoms, within pistol shot of this islet, which makes half a league distance from the islet to the reef that is as far from the shore. We had four strong breezes, which might be called gales of wind, yet we rode with only half a cable, and had not occasion to freshen hawse.

"The Islet Cabras, or Cabra, is nearly half a circle of 200 fathoms diameter, and has a hillock about the height and length of 30 feet, with a cut in the middle, of near 10 fathoms; and this is what breaks off the sea and winds. The French had made there a very good salt-work, which the Spaniards have let go to ruin. It differs from those at Turk's Islands, produces better salt, and is more convenient, as you may introduce the salt water as you want it, in the several pans.

"The landing is easy every where. Very good hay is made on the island: it is a kind of dog's grass, which they pull up by the roots. That which grows by the river's side is coarser. The river (St. Jago) is one league from the island to the S. W. of the town, and marked by a tuft of trees. The water is very good, and easily got. The boat may go in at high water, and at about half a cable's length within, you will find it fresh, the current being so strong that the salt water cannot get in. You have commonly a quarter-wind to fetch it in, and bring it back. Here is very good fishing, and you may haul the seine, as well as near the shore. On the larboard side of the town, about a league from the shore, it is good shooting. You will find plenty of wood-pigeons and India fowls."

The Western Coasts of Hayti or St. Domingo, between St. Nicolas' Mole and Cape Tiburon.

In proceeding from St. Nicolas' Mole, as already observed, you will descry to the southward the Point du Cap au Foux or of Fool's Cape, which lies 5½ miles to the southward of St. Nicolas Point; and the coast thence trends 2½ leagues more, nearly in the same direction, to the Point de la Perle, or Pearl Point.

This part of the coast is steep, without any shelter; but here it is generally a calm. The currents in-shore set to the northward, and two leagues in the offing, to the W. and W. S. W.

PLATTE-FORME, OR PLATFORM, &c.—From Point de la Perle the coast rounds to the south-eastward and east, to the point of the Platform, which is at the distance of 3 leagues from the former. This point is easily distinguished, as well by its flat form as by its being the southernmost of this part of the island. The anchorage is before a small sandy cove, at the bottom of which some houses are seen. You anchor near the shore in 8 or 10 fathoms, weedy bottom. At this place water may be obtained after rains, but there is none to be had at other times.

To anchor under the Platform, bring its southernmost point E. by S., the westernmost point in sight W. N. W., the watering place N. N. E. Then come to in about 9 fathoms. In deeper water the ground is foul; and the nearer the shore the clearer the bottom. The bank is very steep for two cables' length. Without, 10 fathoms soundings will not be found. The bay is very convenient for cruizing ships to heel and boot-top in, &c.

From the Platform Point to Point a Pierre, on the south side of the entrance of the Port of Gonaives, the bearing and distance are E. 18° S., 10 leagues. The point is high and steep, and all the coast between is safe, and may be ranged very near. There is anchorage, even for large ships, at Henne Bay and at Port Piment, but it ought to be

used only in case of necessity. In the winter months there are tornadoes or gales of wind almost every night, coming from the S. E., some of which are violent; and unless you have business on this part of the coast, it is best to stand off two or three leagues, so that you may, with any wind, keep to the westward.

GONAIVES.—The bay of Gonaives or Gonnaheeves, as the French pronounce it, is very large and fine, the anchorage excellent, and the entrance very easy. You range along the shore, at half a league or two miles distance, steering nearly east, and let go your anchor in from 10 to 6 fathoms, ooze. You will find from the entrance under Gonaives Point, which is low, and one mile east of Point Pierre, 15 and 12 fathoms; the water decreases as you get into the bay. When you are a good half league from the land and two miles from the Debercadaire, (or landing place,) you will have 6 fathoms. After you have doubled the point, leaving it on your larboard hand, you will see Fort Castries on a point of land, which you must not approach too near, as there is a key that lies about a mile south of the point.

Observe that from the south point of the entrance, a reef extends to the N. E. to the distance of a quarter of a mile. It is nearly steep to from 6 fathoms.

Captain Mackellar says that the harbor of Gonaives is an excellent one, and capable of containing any number of ships of the largest size, completely shut from all winds; it is of very easy access, and generally clear, excepting a small reef that extends about 2 cables' length from Fort Castries, on the north side. The latitude of the town is 19° 26′ 41″, and its longitude 72° 41′ 7″ W. Var. 5° 50″ E. 1817.

Ships intending to anchor at Gonaives, and having advanced to Point Pevis, on the north side of the entrance, will gain soundings in 15 or 16 fathoms, and have the town in sight, bearing about E. by N. they may proceed for the town on that bearing, keeping in mid-channel, or any way near it; then soundings will be very regular. When well up the harbor, you will see Fort Castries, which stands on the north side, on the top of a small hill, about a mile without the town. When this fort bears N. by E. ½ E. you will have 7 fathoms in mid-channel, fine soft mud. When it bears N. by W. ½ W. in 5½ or 6 fathoms, this seems to be the best anchorage, and as close in as a ship of war ought to go. I have been so far up the harbor as to have Fort Castries bearing N. W. in 4 fathoms; but the best anchorage is with it bearing N. by W. ½ W. and the middle of the town E. ½ N., nearly in mid-channel.

The soundings all over the harbor are so very regular, that it is not necessary to have marks for running in and out by; but in the event of having to beat with the sea breeze, you must not stand too near Fort Castries, as there is a small reef extending from it to the southward: the mark for keeping clear of this reef, is a large tree behind the town on with the northernmost houses, bearing E. by N.; but this reef stretches to so short a distance that a ship will scarcely stand so near the shore as to touch it. In standing to the south side of the harbor, give the shore a good berth until without the inner point, and after that you may stand from shore to shore, by your lead, with safety.

ST. MARC, OR ST. MARK.—From Point St. Pierre, without the entrance of the Bay of Gonaives, the distance to Cape St. Mark, in a direction nearly south, is nearly seven leagues. A league and a half to the northward of St. Mark's Bay is a low point, which appears at a distance like an island, and forms a cape that is called La Point du Morne au Diable, or the Devil's Bluff Point: it points out the mouth of the River Artibonite, which falls into the sea two miles northward of the point. There is an anchorage the whole length of this coast for small vessels only.

Cape St. Mark is high, and of a round form; you will descry at a great distance the hillock which forms it, and stands only one mile from the sea side.

The opening of the Bay of St. Mark, lies to the north of the cape; it extends one league within the land, and the water in it has a great depth. Ships anchor in the bottom of the bay under the town, in 15 or 18 fathoms of water; small vessels may come into less water, but they will be very near the shore. In the south side of the bay is a piece of foul ground, extending two miles from a bluff point to the S. E., and on which a reef stretches out about two cables' length from the coast.

The following Description of the Navigation between the Platform and St. Mark, is given by Capt. Hester, an eminent English navigator.

About 9 leagues eastward of the Platform is the fine bay and harbor of Gonaives. All along this coast you are sure, about 10 o'clock in the forenoon, to have the sea breeze, which lasts till night, and then you have the wind off shore; therefore you may stay till that time, before which there is little or no wind at all. If you intend to go into Gonaives, you must keep a good distance off the south point, which is flat for a considerable distance. When you are about the point open with the bay, you will descry a small island, which you must leave on your larboard side and run in with your lead in 10 or 12 fathoms of water. You may also run along close by the island if you choose, in 4 or 5 fathoms.

"About two leagues to the southward of Gonaives is Artibonite Point, and two leagues

farther south, Artibonite River. In sailing from Gonaives to the latter place, it is good to keep your lead; for, as you come near the river, you will find the water shoalen to about 4 fathoms, and after that deepening again to 7 or 8 fathoms.

"This place is very remarkable, the land being high and uneven and a bold clear shore all along to the northward, from the Platform to Gonaives. When you have run 8 or 9 leagues E. S. E. ¼ E., you will then see the land ahead, or eastward, very low by the water side and prodigious mountains over it; this low land reaches from Gonaives to the southward of Artibonite River, about a mile; and its south end, somewhat higher than the rest, appears like a table land, overgrown with weeds and green trees; this is the Devil's Bluff: round its south end is the Bay of St. Mark, the other point of which you can see to the S. W. of the Devil's Bluff. To anchor off the river bring the south end of the low land to bear south, three miles distant; and, as you run in, you will see five or six small houses by the water side; bring them to bear E. S. E., two miles; then the river will bear S. E. On the starboard side, or the south side of the entrance of the river there is, likewise, a small hole, which you may see. Be sure to keep these bearings, and you will be upon a fine level bank, where you may anchor in what water you please, from 20 to 6 fathoms. But, if you go within 2 miles of the shore, you will drop off that bank from 6 fathoms to 20, the next cast; then 50 or 60, and then 90 or 100 fathoms, within less than half a mile of the shore, and from that to 5, at once. When you are at anchor at Artibonite, you may see the Platform, bearing W. N. W., about 10 leagues.

"Artibonite River is not a place of great note, because it ebbs almost dry at low water; neither is there any town in this place, but only some plantations, five or six miles up the river; there you can have good water, but no wood. The sea wind comes on at noon, at N. W., till 10 at night, and the land wind at E. by S., till 8 in the morning."

From St. Mark's Point the coast of Hayti trends nearly S. E., true, six and a half leagues, to La Souffriere, or Vazes Point; and thence E. S. E., five leagues, to Port au Prince. The coast is generally clean and bold, and you may run along it at the distance of a mile, in 10, 15, and 20 fathoms of water. In proceeding thus, you will first perceive the Magazine of Moutroui, and afterwards, the villages of Arcahais, or Arcahaye, and Boucassin; and finally, the city of Port au Prince. Off the coast, at about half way between St. Mark's Point and Port au Prince, are three small islets, called the Arcadins, which are situate at nearly a league from the shore, and separated by channels about half a mile in breadth. Near these islets, on every side, the depths are 5 and 6 fathoms.

To the E. by S. of Boucassin, and very near the coast, is Mouton, or Sheep Key. A passage ought never to be attempted within this key; near it, on the outside, the coast is clear and water deep. About two leagues to the southward of this island is the roadstead of Foso: this to the N. E., and Lamentin Point to the S. W., form the entrance of the Bay of Port au Prince. To the westward of this roadstead is an extensive bank, with a cluster of islets, of which the easternmost is distant about two miles from Foso Roadstead, and the southernmost three miles from Lamentin Point. There are, besides, two other islets, which lie almost in the direction of the two points of the bay, and which are four miles from Foso Road, and two from Lamentin Point.

PORT AU PRINCE.*—The shore at the bottom of Port au Prince Bay is very foul, and has a large group of islets. These form the inner anchorage; and to gain this, the aid of a pilot is indispensable; but the Grand Road is without the reefs, and may be entered without a pilot.

Those bound to Port au Prince from the N. W., after having made St. Mark's Point, may shape their course, either to pass between the Arcadins and the coast, or between them and the Island Gonave: the first appears to be the best route, for thus the foul grounds on the S. E. side of Gonave must be avoided: it is also to be observed that the wind in the channel is generally from the N. E.; the nearer, therefore, you pass to the main land, the more free will you run to the eastward. Again, almost every afternoon, in the rainy season, there are tornadoes in the channel, which compel vessels to lie to, and to keep on boards or tacks, that they may not fall upon the reefs of Gonave. If you can foresee the gale, it will be best to gain an anchorage near Arcahais Point, and there ride it out.† When past the Arcadins, your course will be about S. E. by S. to get near Lamentin Point. If caught by night to the eastward of this point, here you may anchor. From the point to the anchorage of Port au Prince, the distance is four miles; and to make it you must steer towards the city, and anchor about half a mile outside the islets, in 10 or 15 fathoms.

The channel between the Arcadins and coast is two miles wide, and in the middle of it you will never have more than 28, nor less than 10 fathoms. The water decreases towards the Arcadins to 6 or 8 fathoms, corally ground; at the same distance from the opposite shore is the like depth, with muddy bottom.

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* See Plan by Com. R. Owen, published by E. & G. W. Blunt, 1833.

† Or, you may anchor to the northward of Leogane, on the south side of the channel, upon the ground extending from Gonave Island, as shown in the chart.

From Pearl Point to the entrance of St. Mark's Channel, midway between Cape St. Mark and the Island of Gonave, the course and distance are S. E. ½ E., sixteen leagues. This will bring you to the westward of Cape St. Mark, for which you may steer; or, you may continue the same course six leagues farther, which will lead clear of the Arcadins.

Should it be night when you enter the channel of St. Mark, you should steer S. S. E. ½ E., in order to clear the Arcadins and the eastern end of Gonave Island. Having run about four leagues on this track, the course will be about S. E. by E., five leagues, to make Point Lamentin, which is on the south side, to the westward of Port au Prince. You may range along this coast without fear, only avoiding the shoals of the sandy key, which lie at a short league northward of the point. Should you pass this point in the night, you would do right, after you have run a mile, or a mile and a half, to anchor; you will find 12 or 18 fathoms water, the ground good and the water always smooth.

You may be forced to turn in this channel, but you must not go so near to the Gonave as to the St. Domingo side; the latter being safe, may be approached any where, within half a league.

The Arcadins, as before noticed, are not to be feared: a shoal stretches out from them a mile, or half a league at most, with 5 or 6 fathoms on it; on the edge of the west and south-west sides, you will have from 12 to 15 fathoms, corally ground: but there is good ground to be found in 8, 12, and 13 fathoms, coarse sand and shells.

GONAVE ISLAND.—The greatest length of Gonave Island is 10 leagues E. S. E. and W. N. W.: its breadth, which is very regular, is nearly two and a half leagues.

This island was surveyed in 1787, by M. de Lieude de Sepmanville, who has given the following description of its coasts and the adjacent dangers.

The most dangerous reefs are those which lie to the S. E. of Petite, or Little Gonave, which is situate near the S. E. point of the great island. These seem to be joined with the land of the Little Gonave, and stretch more than a league into the offing, lying at about 800 toises, or nearly a common English mile from the shore. A vessel may pass, in an urgent case, between them and the Little Gonave; but the attempt would be imprudent, especially if the wind be not well set in, as the currents are very strong and irregular. I have observed, however, that in this part, they run more generally to the N. N. E., and between the two Gonaves.

Small vessels, drawing 8 or 9 feet of water, may find a good anchorage to the west of the Little Gonave, which may be best entered from the southward.

The N. E. point of Gonave, called Galet Point, is low, and bordered with a reef, which stretches along the east coast, towards the south, and extends 1100 toises, (1170 English fathoms,) opposite the place called Trou a l'Eau, or Water Hole: within is a white ground, where there are from 4 to 6 fathoms of water.

To sail near this reef, which every vessel can do that draws 9 or 10 feet, you must, in coming from the east, take a channel which is opposite to a fisherman's hut. There are several other channels, which are easily known by the non-appearance of white ground. About 88 fathoms within the reef, you may range along the coast as far as Anse a Galet, or Galet Cove, in case the wind should fail. There is anchorage every where; but the places to be preferred are Piron Cove, Consantin's Hole, and especially Galet Cove, which are very convenient; the hold is good, and the reefs shelter you from the swell of the sea.

The several anchorages on the north coast, for boats or schooners, are, L'Islet a Marc, Grand Lagoon, and Bahama Channel, where you are equally sheltered; the remainder of the coast is likewise bordered with reefs, but they are very near the shore, and you find there no anchorage.

The western part is an ironbound coast, along which you may range pretty near; but it is not so from the S. W. point of Point-a-Retoures, where you may find a number of small detached reefs, almost even with the water. Several small vessels may anchor in that part, on the spot named Les Baleines, or the Whales, but not without a pilot well acquainted.

The only place where two or three large ships, such as frigates, can anchor, is La Baie du Parc, or Park Bay, which lies to the N. W. of Point Fantansque, the south point of the island; but coming into it is dangerous, on account of several detached reefs, which are never seen.

ROCHELOIS.—The reef called Rochelois had been fatal to many ships, and was still much feared by navigators, its true situation having never been well ascertained: it lies in the channel which separates the south coast of the Gonave from that of Hayti. M. Le Compte de la Luzerne ordered me to survey, and determine the position of that reef. I went and anchored within a cable's length of the rocks, which are above water: I landed on these rocks, where I took four observations of latitude, as well as the bearing of all the objects in sight; and, having measured the whole extent of the shoal, I found its breadth to be 2000 toises, (2130 fathoms,) in a direction N. and S., nearly, and its length 3155 toises, (3360 fathoms,) from E. to W.

The rocks, called Pirogues, which are towards the middle of this reef, were already known; I found their extent to be 125 toises, (133 fathoms;) they are quite uncovered at low tide, but three heads only are perceived at high water. M. Le Compte de Chastenet Puysegur, who had occasion to explore the extent of this reef, says, in his account of the navigation along the coast of St. Domingo, that the rocks, which show themselves at low water, are the only things to be feared on the Rochelois: but I have found two other shoals, of very small extent, which are very dangerous, since they have only two fathoms water. They lie to the N. W. of the rocks in the middle, one at 800 toises distance, and the other at 300. There may be some other dangers on the Rochelois, but I could not make myself sure of it, having been only four days on that expedition. Prudence requires that, with a large ship, you should avoid it entirely: there is more room for tacking to the north of that reef than to the southward of it: you are only to keep at the distance of one mile, at least, from Gonave, if you pass by the north; whereas, in passing by the south, you may range along the Haytien coast, which is clear and safe.

The latitude of the middle of the Rochelois, deduced from the four observations, is 18° 37′ 20″ N.

PORT AU PRINCE, to the WESTWARD.—On leaving Port au Prince, when bound to the Petite Goave, you may range along the south coast, at the distance of one or two miles, all the shores being bold and safe, as far as Point Leogane.

From Point Lamentin to Leogane Point, there is no anchorage; but you will find a good bottom for anchoring between the latter point and the anchorage off the town of Leogane.

From Leogane, the coast trends to the south, and forms the Bay of Grand Goave and Petite Goave, which are separated by a point and a hill, named the Tapion, or Hummock of Goave. You enter into Petite Goave Bay, by leaving on the larboard hand an islet which is very near the coast, and which lies to the north of the town; to the westward of this islet you may anchor in 9, 12, and 15 fathoms. Petite Goave is 10 leagues from Port au Prince; but, as you are forced to double Point Leogane, the run is longer.

MIRAGOANE.—From the Hummock of Petite Goave to the Tapion du Trou Chouchou, or Hummock of Miragoane, the coast runs west, eight miles; thence W. ½ S., six and a half miles, to the careening island, or Miragoane Bay.

To anchor at Miragoane, you come within a mile of the careening island, when you perceive a small town at the foot of a mountain, and some mangrove islands to the westward. You keep the mid-channel, between the first islet and the shore, where the village is situated, and come to an anchor within, in from 18 to 8 fathoms, sandy bottom. This anchorage ought not to be taken without a pilot; the channel is not more than a cable's length in width, and you must anchor so soon as you are within.

From Miragoane Careening Island, the coast bends in, and forms the bay of that name. It is shut in on the north by Frigate Island, a small islet, from which a white shoal extends half a league to the eastward, and nearly north, to the anchorage at Miragoane; which obliges you, in coming in or going out, to keep the island shore very close aboard. From this place the coast trends west, to the village of Rochelois, which is situated at the foot of a large hummock.

From Miragoane, the coast to the westward is clear and deep; and beyond Rochelois, are seen the towns of L'Anse-a-Veau and Petit Trou. From the last, the coast forms a large bay, Baradaires.

BARADAIRES BAY.—From the village of Rochelois to the entrance of the Bay of Baradaires, the coast runs W., 5 leagues. Baradaires Bay is formed on the S. E. by Roitelets Point, and on the N. W. by the Bec du Marsouin, or the Porpoise Snout; these points bear from each other nearly N. W. and S. E., four miles. Near the east coast of the bay there is an island, with several islets, which send out a reef and shallow, that almost join the western coast, leaving a pass, or channel, of only five or six cables' length in breadth. To proceed into the bay, you keep along the peninsula of the Bec, and come into from 8 to 10 fathoms. There is a good depth of water in the middle of the bay, which is of great extent; but there are several weedy shoals, which prevent your going in without a pilot, well acquainted.

THE CAYMITES, &c.—The northern extremity of the Bec de Marsouin, and the north part of Grand Caymite Island, bear nearly W. N. W. and E. S. E., four leagues.

The coast west of the peninsula of the Bec bends in to the southward, and forms a bight; thence, rounding out a little, it trends W. by N., as far as Point Jeremie. This bight and Great Caymite Island, form a large bay, called Caymite Bay, where there is very good anchorage for all sorts of vessels. You may come to it without a pilot, and anchor under the island, in what depth you choose. You may also proceed to Flamand's Bay, near the peninsula, ranging along the peninsula side, and anchor opposite a sandy beach, in what depth you please.

The Bay of Caymites presents several very fine anchorages, very easy to come at with

the assistance of the lead alone; but there is not a good passage between the Grand Caymite and the shore; and you will not find more than 13 feet water upon the white shoals of the Little Caymite, or of Foucaud Islet; and then there are several coral rocks, which rise within two or three feet of the surface of the water, so that no vessel, but very small ones, ever attempt it without a pilot. These white shoals extend 3 leagues W. S. W. from the Grand Caymite.

JEREMIE.—From the north part of the Grand Caymite to the Point Rivière Salée, or Cape Rosa, which is one and a half league W. N. W. of Point Jeremie, is nine and a half leagues; this Salt River Point is the northernmost point westward from Port au Prince. Under Point Jeremie is the village of that name, whose anchorage is very small, and not proper for large ships; schooners and small vessels may anchor within the reef, but no ships which draw upwards of 12 or 14 feet should ever anchor here, except in case of necessity, there being no shelter for them: in short, it is a bad anchorage, which must be avoided during the norths.

From Cape Rosa, or Salt River Point, to Cape Dame Marie, or Donna Maria, the coast trends W. S. W., 13 miles.

All this shore is safe and bold within a quarter of a league; it does not present any shelter, although, in case of necessity, you might anchor in the Anse a Claire, or Clair Bay, which is 1¼ league from Salt River. This bay, or rather cove, is so very small, that two ships, 100 feet long, would be embarrassed by each other: it can only serve as a shelter to very small vessels, and is easily discovered by keeping along shore.

CAPE DAME MARIE, OR DONNA MARIA.—So soon as you descry Cape Dame Marie, by the false cape of that name, and are half a league distant from it, you will strike soundings of from 15 to 18 fathoms, and may range along this cape, at the distance of a quarter of a league, in from 8 to 12 fathoms, weedy bottom.

To anchor in the Bay of Dame Marie, you must keep the shore on board, steering about S. E., the wind being generally adverse; and with your lead you come to an anchor W. N. W. of a large white tapion, or hummock, on which stands a battery, and within a musket shot of which you will find 5 fathoms. There is anchoring bottom all over this bay; a mile from the shore you will have from 4 to 6 fathoms, and at 2 miles, from 6 to 10. You will be sheltered from the winds between the north and south, passing by the east; notwithstanding which, ships that lie in 8 or 10 fathoms will feel the swell, if there is a fresh breeze without. In entering, keep about half a mile off, but not less, in order to keep clear of a reef which extends to the length of a cable and a half to the west from the cape. Preserve this distance from the coast until past the False Cape, to the southward of Cape Dame Marie, and which is also foul. When once past False Cape, you may haul to the wind, which is generally scant in the bay, to get the vessel's head to S. E., with which course, and keeping the lead going, you may gain the anchorage as above.

From Cape Dame Marie the coast runs S. by W., 5 leagues, to Point des Irois, and forms, at that distance, several bays and coves, where vessels may anchor. In general, a frigate may run in along this coast with her lead, and anchor in any part, there being no shoals, or any danger under water, the ground gradually increasing towards the shore.

To the S. by W. of Cape Dame Marie, 2½ leagues distant, and about half a league off Point Ministre, or Minister Point, are some rocks, called Les Baleines, or the Whales. These rocks are above water, and surrounded with a white shoal, which does not extend more than half a cable's length from them, and on which are 4 fathoms. A ship can sail between it and the shore. In the mid-channel she will have 6 fathoms, and may go as close as she pleases to take them on the off side. The sea always breaks on this shoal.

One league to the S. S. E. from the Whales lies Pierre Joseph's Islet, where a convoy may anchor. The anchorage is very good and easy, and large ships anchor to the S. W. of the islet.

All along this western coast you have ground at 2 leagues from the shore, the depth gradually increasing as you leave the land; so that, in general, you will find 4 and 5 fathoms, at one mile distant; 10 or 12 at 2 miles, and regularly from 15 to 17, at 3 miles. When you get into 30 fathoms, you will lose soundings suddenly.

POINT DES IROIS, OR IRISH POINT, as the English sailors call it, is the westernmost point of Hayti. It is not very high, though remarkable from a small hummock on its extremity, which appears detached from the coast, and makes like an island. This point forms the north part of the Bay des Irois, or Irish Bay. You may range very close to the land on the north side of the bay, there being from 9 to 18 fathoms, touching the shore.

The anchorage is to the N. W. of a black rock, which is seen a little way to the southward of the town. It is in from 9 to 10 fathoms, shelly ground. You may anchor likewise to the southward of the rocky islet, N. N. W. of a small hummock, towards the middle of the bay. The depth is here from 8 to 9 fathoms, sandy and muddy ground.

The bay is exposed to southerly winds. There is always a great sea within, and the Debercadaire, or landing place, is of course a bad one. It is situated in the eddy of the

currents, which set to the northward, on the west side, and to the S. E. on the east coast. Besides, the sea in the offing is alternately agitated with violence by the N. E. and east breezes, which prevail on the west coast, and by the S. E. winds that blow on the south coast. Irois Bay is terminated to the south by Cape Carcasse, which, with Cap a Foux, or Fool's Cape, forms a large roundish point, whose end is at Cape Tiburon.

CAPE TIBURON.—These three capes, seen at a distance, form but one, which is called Cape Tiburon, and is very easily known by its form and height. It is a large mountain, very lofty, whose top is rounded like the back of a dosser, or French band-basket, and comes gradually down towards the sea.

Cape Tiburon, properly speaking, is 5 miles S. 25° E. of Irish Point, and forms the entrance of Tiburon Bay, which is to the eastward of it. Its situation is latitude 18° 19′ 25″, longitude 74° 27′ 32″. You will get no ground at 50 fathoms, 2 cables' length from the coast, between Cape Carcasse and very near Cape Tiburon; but off the latter, at that distance, you will have from 24 to 30 fathoms, and a little farther out, quickly lose soundings.

On the north shore of Tiburon Bay, the water is deep to within 2 or 3 cables' length of the rocks, and within half a cable's length you have 6 and 7 fathoms, stiff clayish ground. On the east and S. E. shores you have 4 and 4½ fathoms, fine muddy ground, within a cable's length, all round. The edge of soundings runs as the bay forms, half a mile from its head. You may anchor any where in the bay; but bring Point Burgos, the south point, (which is foul,) S. by E., and the pitch of Cape Tiburon W. N. W., in 4 or 5 fathoms. From that to 8 or 9 is very good ground. Wooding and watering in plenty. You may either land your casks, and roll them over a narrow neck of land into the river, or fill them in your boats with buckets.

Directions for making the Island Hayti, and its different Ports.

[From the Derrotero de las Antillas, &c.]

If a vessel is bound to a port on the north coast, she may, as we have already shown, at once get into the latitude of Cape Cabron, without making any of the Carribbe or Virgin Islands. By this she will go clear of the dangerous Isle of Anegada, and be sure of not getting to leeward of her port of destination. Having made Cape Cabron, no more is to be attended to than to follow the coast, at a proper distance from the projecting points, and without getting into the bays it forms, until approaching your destined port, when you may keep so near to the coast, to windward of it, as to make sure not to pass it. If bound to a port on the south coast, it is proper to make the Island of St. Bartholomew, passing its south side, and run down by the south of Porto Rico, to make the Island of Saona, if you are bound to the harbor of St. Domingo, or to Ocoa Bay; but if not, you may proceed at once to make Beata and Altovela, passing to the south of them, and so directing yourself as to approach the coast to windward of your port of destination, in sufficient time to be certain of not overrunning it. Those bound direct for harbors on the west end of the island, ought to make the north side in the rainy season, or season of the souths, and the south side in the dry season, or that of the norths: thus they free themselves from the dangers and anxieties which the souths cause, in the first instance, and which the norths cause in the second; for it is well known to every seaman, that not only is an off-shore wind not dangerous, but that it allows of continuing your voyage; for, though it may blow very hard, it can raise no sea, and you can regulate the sail according to circumstances.

In navigating from leeward to windward, this island affords the very great advantage of land breezes. It is well known that the nearer you are to the land, the fresher these winds are, and therefore the farther you can run with them: thus, in this case, it answers to keep as near along shore as you can, which is sufficiently easy, and keeping in mind the particular description of it, you need not fear.

If it be a matter of indifference to you, whether you beat up the north or south side, you ought to choose the first in the season of the souths, and the second in the season of the norths; and this is the more requisite, as when you are running from windward to leeward, you have not the same necessity to keep near land, as when bound from leeward to windward; and it is very certain that, in the latter case, if either a north or a south catch you, when very close on their respective coasts, fatal consequences may ensue: but if it be not a matter of indifference to you which side you work to windward on, or that you must of necessity take one in preference to the other, notwithstanding the obstacles, the risk, at greatest, is not such as ought to thwart a navigator from this track, who knows that in proportion to his difficulty must be his vigilance and activity.

Relative to the currents which may be found along the shores of Hayti, we may add that their effects may be looked upon as inconsiderable. Some, however, affirm and suppose, that there are currents of a mile an hour setting to the westward; but, for our-

selves, we can only say, that we have no foundation for such an assertion, but rather have grounds for thinking them of little importance.

The Windward Channel between Hayti and Jamaica.

By the Windward Channel is meant that channel which lies between Hayti on the one side, and Cuba and Jamaica on the other. The coasts which form it on the east and north have already been described, and the coasts of Jamaica are described hereafter. The breadth of the channel between Cape Tiburon, in Hayti, and Morant Point, the eastern end of Jamaica, is 31 leagues, in a W. S. W. direction; and to the northward of this line is the little isle called Navaza, and a dangerous shoal bank, called that of the Formigas; to the southward is a bank of soundings, but clear of dangers, and the Morant Keys, with their surrounding bank. These we shall describe in order.

NAVAZA is about 2 miles in length, E. S. E. and W. N. W., and about 1½ mile broad at its widest part. It was surveyed in 1803 by Mr. Francis Owen, Master, R. N., who says, "This island is a flat level rock, apparently of volcanic origin, is above 300 feet in height, and covered with small shrubs. It may be seen on a clear day from the deck of a line of battle ship, about 7 leagues. Every part thereof shows a rocky perpendicular cliff, except a small space on the northern side, which is but little above the surface of the sea. From the western extremity of the island, a coral reef stretches to the westward about 100 fathoms, on which are only 27 feet, with 15 fathoms all round it. In every other part there are 12 fathoms water close to the shore. On the western and southern sides, soundings from 16 to 40 fathoms, sand, extend to the distance of three-fourths of a mile, on which you may anchor and lie smooth in a strong sea breeze. On the north side the bottom is rocky, and the bank does not extend beyond half a mile. In crossing this island, on its eastern side, at the distance of about one-third of a mile, you will have 34, 25, and 18 fathoms; and at half a mile, 38, and soon after, no ground, with 75 fathoms. At the distance of 1½ mile from the east end, no bottom will be found with 230 fathoms. The N. W. end bearing N., or N. by E., and the S. E. point E. S. E., or a little more southerly, you may anchor in 16 fathoms, fine sand, about half a mile rom the shore. There are great quantities of sea fowls on the island; and round the rocks, cod and red snappers in abundance. Between Navaza and Cape Tiburon there is a small bank of fine white sand, with plenty of fish thereon. The depth is from 14 to 16 fathoms, with the following bearings: Navaza, W. ½ S.; Cape Tiburon, E. S. E. ½ E.; and Cape Dame Marie, N. E. ½ E., by compass.

From Navaza to Cape Dame Marie, the bearing and distance are N. E. by E. ¾ E., 14 leagues.

From Cape Tiburon to Morant Point, which is the east end of Jamaica, the bearing and distance are W. S. W. ½ W., 34½ leagues; and from Navaza to the same point, S. W. by W. ⅓ W., 23 leagues.

THE FORMIGAS, OR ANTS, are some dangerous coral spots upon a sand bank, nearly 9 miles in length, extending in a N. E. and S. W. direction, about 10 leagues to the westward from Navaza. Its eastern part bears N. E. by N., 40 miles from Morant Point, Jamaica; and from the body of the shoal, the N. E. end of Jamaica bears S. W. by W., 38 miles. The eastern part is the shoalest, not having, in some places, more than 13 or 14 feet of water. The edge here is nearly steep to, and there is generally a great swell upon it. In standing over the bank, when the depth increases to 7 or 7½ fathoms, there will be a sudden increase to 13 and 15 fathoms, and thence no bottom at 20. On the eastern edge the bottom is dark, and not easily seen in hazy weather; but to the westward the water is discolored, and appears lighter.

The centre of the bank is about 18° 30′ N., and 75° 40′ W. The fall of the high land over Plaintain Garden River, which is the easternmost high land on Jamaica, bearing S. W. by S., leads directly on the bank.

THE MORANT KEYS.—These keys, which lie at the distance of 32 miles S. S. E. from the east end of Jamaica, consist of four low islets or keys, situate in form of a crescent, and are surrounded by a dangerous reef. They are distinguished by N. E. Key, Sand Key, Savanna, or Bird Key, and S. W. Key. You may approach within 2½ miles of any of them. The reef on the eastern side is a most dangerous ledge of coral. The keys lie between lat. 17° 24′ and 17° 28′, long. 75° 55′. To the N. W. of them is good anchoring ground, in 5 or 6 fathoms, white sand and shells. To anchor, give the N. E. Key a berth of 1½ or 2 miles; and when the S. W. Key bears S. by E., steer directly for it, and you will pass close to westward of the rocky spit, that extends to the westward from the N. E. Key, and has but little more than 3 fathoms over it. When the N. E. Key bears E. by N., or E. N. E., you may haul more to the eastward, and anchor with the S. W. Key bearing S., or S. by W., and Savanna Key, the next to it, S. E., in from 5 to 6 fathoms, sandy bottom. As there are some spots of coral, it is requisite to ascertain that the bottom be clear.

These keys are only 7 or 9 feet above the water. The body of them lies from Port Morant, Jamaica, S. S. E. ½ E., about 11 leagues. With the keys bearing S. W., nearly

4 miles, there are about 18 fathoms water, stony ground, mixed with fine red speckled gravel. With them S. W. by S., about 4 miles, there are 16 fathoms; and when S. S. W. ½ W., 6 miles, there are 23 fathoms, with ground as above.

In order to ascertain when you are to the eastward of the keys, observe that Morant Point, or the east end of Jamaica, and the north-east end of the same, bear from each other N. W. ½ N. and S. E. ½ S., so that when the north-east end, which is high and bluff, is to be seen on that bearing, or to the westward of it, you will be to the eastward of the keys.

Also, when coming in from the southward for Jamaica, by keeping Yallah's Hill, hereafter noticed, to the northward of N. W. ½ N., you will pass clear of the keys to the westward.

Be very cautious on approaching the keys in the night, lest you be driven on them by the current.

In turning between the Morant Keys and the east end of Jamaica, there is a good 8 leagues of turning ground; and as it seldom happens that the land is not descried before night, its bearings may direct in turning or sailing.

Capt. Mackeller tells us that the cocoanut trees formerly on Morant Keys have been cut down since 1816, and there is not a shrub of any kind to be seen, except a few small cocoanut bushes on the N. E. Key. Very great care should be taken in approaching the N. E. Key, on either side, as it is foul to a great distance off; and vessels intending to anchor at the keys, ought not to come on the white water at all, that is, to the westward of the N. E. Key, until they are far enough to the southward to have the south part of the N. E. Key bearing E. by N.; they may then haul up to the eastward of Savanna, or Bird Key; and when it bears S. E., and the S. W. Key S., or S. ½ W., anchor in 5 or 6 fathoms. If it is necessary to work up to this anchorage, with the wind east, you may stand to the S. W. Key, by your lead, not going nearer than 5 or 6 fathoms; but the reef off the N. E. Key is steep to, and you will have 6 fathoms at one cast, and the next 3, or perhaps less; therefore, in working up, keep the point of the N. E. Key always to the northward of E. by N., after you are in the white water.

Directions for the Windward Passages, which is the principal channel to the north-eastward of Jamaica, including those for sailing to and from Jamaica, and thence to New Providence, Havana, Europe, &c.

Ships from Europe, when bound to Jamaica, generally take the broad and safe channel between the islands and Gaudaloupe, but they may pass it with equal safety between St. Bartholomews and Saba, or St. Eustatias, and thence make the parallel of 17° 20′ to the southward of Hayti, or on the meridian of 70° W. When thus far advanced, they may continue W. ½ S., until they make Altovela, or the Little Mount, which lies off the southern point of Hayti, as already described. They will thus avoid the dangers in the vicinity of Neiva Bay, towards which there is frequently an indraught, as before noticed.

Should you happen to miss Altovela, you may probably make the land of Jacquemel, or Jacmel, before described; or, if not, with the next great promontory, of which Point Abacou and Point a Gravois are the extremities. Jacquemel may, as already shown, be distinguished from sea by the sudden cut-off or drop of a hill, seen over another long hill at the upper part of the harbor. This mark leads directly to the harbor's mouth.

The Isle a Vache lies to the eastward of Point Abacou, and forms the channel to Aux Cayes, &c. From Altovela to the east end of the Isle a Vache, the bearing and distance are W. by N., 42½ leagues. From the east end of the Isle a Vache to Point Abacou, W. by S., 14 miles; thence to Point a Gravois, W. ½ S., 2½ leagues.

When off at sea, abreast of the Isle a Vache, the middle of a saddle mountain over Port St. Louis bears nearly N. by E., and then the eastern end of a Vache is between it and the ship. The island is low, though hilly, and lies so under the land of the main, that it is not distinguishable from it at any considerable distance. At 6 leagues off it appears, as already said, like an assemblage of small islands. The water towards it shoalens gradually.

The saddle mountains over St. Louis, which are called the Grand Anse Mountains, are the second high range from the west end of Hayti. The westernmost, which is the highest, may be seen in clear weather 30 or 40 leagues off, on both sides of the island. Observe, however, that after noon the exhalation of vapor is sometimes so great as to render them invisible. Be cautious, at such times, of making the land, lest you run on the dangers of the Isle a Vache.

From Point a Gravois to Cape Tiburon, the bearing and distance are N. W. by W. ½ W., 13 leagues. The land about Cape Tiburon is so high as often to be seen at more than 20 leagues off.

Morant Point, the easternmost extremity of Jamaica, already noticed, bears from Point a Gravois, W. ¾ S., 42 leagues; and from Cape Tiburon, W. S. W., 31 leagues.

In running for Jamaica, from the west end of Hayti, or the Isle of Altovela, be cau-

tious of running too far north, lest you should get on Morant Point, this point being, as already shown, extremely low. In thick hazy weather, it may possibly be approached so near as to make it difficult to weather; the wind setting right on, and the current always going to leeward. By keeping the proper parallel, (17° 45′,) you will run down without danger, and make Yallah's Point, off which you are sure to meet with pilots, who will conduct you to Port Royal Harbor, if required.

Sailing Directions for the Coast and Harbors of Jamaica.

MORANT POINT TO KINGSTON.—The southernmost high land of Jamaica, to the eastward of Port Royal, is Yallah's Hill, which is very remarkable. The middle of this hill is 20 miles to the eastward of Port Royal Point. When the fall of this hill bears W. ½ N., steering W. by S. will carry a vessel a league or more to the southward of the east end of the island, which is very low. The latitude at noon will be a guide; for when Yallah's Hill bears W. ½ N., 11 or 12 leagues distant, the ship will be in lat. 17° 50′, or 17° 51′.

Should you make the southernmost high land, bearing W. S. W., 9 or 10 leagues distant, when bound to the south side of the island, you must haul up S. W., to clear the east end, which will not be in sight at a greater distance than 4 leagues; and observe, also, that a current frequently sets to the northward around this end of the island.

From off Morant Point, or the east end of Jamaica, when bound to Port Royal, ships should keep at a distance of 4 miles from shore, until past Morant Bay, as the coast from the east end to the southward of Rocky Point is lined with a reef that stretches nearly 2 miles outward, and over a part of which the sea generally breaks.

To the westward from Rocky Point the coast continues rocky to about one mile from the shore, as far as Morant Bay; it is then clear to the white cliffs called the White Horses, off which there are some rocks, at about half a mile from shore.

From the White Horses to Yallah's Point, the distance is one league. In running down, when the former bear north, and Yallah's Point west, you will have soundings, and frequently see the bottom in 7½, 8, 9, and 10 fathoms; and on approaching Yallah's Point, the water will be found to deepen until you lose soundings.

From Yallah's Point to Cow Bay Point there is no danger; the latter is bold to, as well as all the coast to the westward, as far as Plum Point. The course and distance between the two Points are W. by N., 8 miles; but should you be 3 or 4 miles from Cow Bay Point, you must steer more to the northward.

Plum Point is the south-east point of the Palisadoes; you may run in boldly for it, and approach its extremity within half a cable's length, having nothing to fear until abreast of it, or between it and the Middle Ground, in the entrance of the eastern channel to Port Royal.

When you have brought Rock Fort N. by E., you will come on a cross ledge without the entrance of the channel, and must then bring the leading mark on, which is the north part of the Apostle's Battery and the magazine of Fort Charles in a line. This mark is to be kept on until you are abreast of Lime Key. When thus far advanced, steer a little to the southward towards Rackham Key, giving Lime Key a good berth, until Port Royal Point comes open between Gun Key and Rackham Key. Now steer in mid-channel between these keys, and immediately after passing them, proceed directly towards Port Royal Point, till you bring the fall of Yallah's Hill on the centre of Gun Key, which will bring you between the Knoll and Port Royal Point; you may approach the point within half a cable's length, and by sailing close to it, you will also pass between it and the Harbor Knoll, which lies to the westward about the length of a cable and a half, with 19 feet on it.

Having passed the point, steer to the northward till the Admiral's Penn comes to the north of Gallow's Point. This mark leads you clear of Old Port Royal, where you may anchor abreast of the Dock Yard, or even before you come to it. With a land or north wind, the channel between Gun Key and Port Royal is to be preferred; then the Twelve Apostles' Battery on the south angle of Fort Charles leads you clear of Gun Key Reef.

Strangers, in case of necessity, may pilot their ships down to the anchorage in the channel, even when the marks are not to be seen, as nothing is to be feared on the side of the Palisadoes, which is low and bushy. They must only keep within half or three-quarters of a mile of Plum Point, and steer down by the Palisadoes, till they bring Lime Key to bear S. S. E., or S. E. by S., then they anchor in 15, 16, or 17 fathoms, near the middle of the channel.

SHOALS IN THE EASTERN CHANNEL OF PORT ROYAL.—The most remarkable shoal in the Eastern Channel is the Middle Ground, or Eastern Middle Ground, which lies one and a quarter mile S. S. W. from Plum Point; it consists of two patches, rocky bottom; the east patch having 12 feet, and the west patch (about 70 fathoms to the W. N. W. of the other) having 9 feet; they are divided by a narrow swash, 10 fathoms deep, and both break with strong sea breezes.

A beacon, with a small triangle, about 50 feet above the level of the sea, has been erected on the Palisadoes, between Great and Little Plum Points. When bearing N. by W., by compass, or in one with Kingston Church, it will lead clear to the eastward of the East Middle Ground.

You may sail within the Middle Ground, or without it to the southward, as necessity requires: but to the northward is the best and safest channel. The soundings in that channel are uneven, from 7 to 19 or 20 fathoms; but when you are past the Middle Ground, they are regular, from 19 to 13 fathoms, between Rackham and Gun Keys.

The first key you meet with, in steering from the Middle Ground towards Port Royal, is Lime Key, from the north end of which a reef stretches about a cable's length; your eye is the best mark for it, as it is generally seen: to the westward of the key lies another shoal, with 8 or 10 feet upon it.

The knoll off Port Royal Point is the third shoal; it is a small hard coral bank to the southward of the point, with only 16 feet water upon it. If your ship draw 12 or 13 feet water, you must be careful to keep clear of it.

To go within the knoll, the leading mark is to bring the highest bush on Gun Key (which is near the middle of it) in one with Yallah's Point; you have then 10 fathoms water, and the channel is 70 fathoms wide. The mark to strike the knoll is the south point of Gun Key on the high hill of Yallah's, or a ship's length open of Yallah's Point; the breast mark is the church on the seventh or eighth embrasure of the fort, Sandy Key just open with Lime Key, and you will have 16 or 17 feet of water.

To go between the knoll and the Western Middle Ground, which lies about 300 fathoms to the south-westward of it, the leading mark is True Land's Hummock within Yallah's, on the southernmost part of Gun Key, or Yallah's Point, well open to the northward of the north point of Rackham's Key. This channel, which is the widest, and has 12 fathoms of water, is mostly used when taken with the land wind.

The anchorage is good all over Port Royal Harbor: but the best anchoring for ships that are bound to sea, is in 9 fathoms, with a notch on the east side of a high mountain, called the Leading Notch, a little open to the eastward of Fort Augusta, and Rackham Key in one with Port Royal Point.

SOUTH CHANNEL OF PORT ROYAL.—To go to sea from Port Royal, you make use of the South, or the New Channel; the small craft generally go through the East Channel, but it is to be avoided by large vessels, unless they are prime sailers, and have a strong land breeze or north, with an appearance of its lasting long enough to carry them through.

When bound through the South Channel you should get under way with the land wind, so soon in the morning as you can see the marks, observing that the current then sets most commonly to the westward. The general leading mark is the Leading Notch in one with the magazine of Fort Augusta, which is the easternmost building of the fort. This mark leads ships of 16 or 17 feet water clear through; but in a line of battle ship, the notch should be kept very little to the eastward of the magazine, until Hellshire Hummock comes open with Fort Small.

To keep well to the westward of the Middle Ground, be careful not to bring the church steeple upon the corner of the wall with embrasures, until Yallah's Hill is brought in one with Lime Key. In case you should not see Yallah's Hill Point, look out for a hummock on Hellshire, and when it is open of Salt Pan Hill, you will be to the southward of the Middle Ground.

The Middle Ground is a large coral bank, which often breaks, with only 8 feet on it in the middle; the north and west sides are almost steep. On its N. W. edge lies a buoy, whose marks are, Port Royal Tower on the fourth embrasure of Fort Charles, counting from the westward, and Hellshire Hummock on the flag-staff of Fort Small.

When you have opened Hellshire Hummock with Fort Small, you steer out with the Leading Notch a little to the eastward of the magazine, which carries you between the Drunken Man's Key, the Turtle Heads, and the South Knoll; or, to avoid these heads, you are to haul up so as to bring the church steeple to the easternmost part of the fort, and continue to keep that mark until the South Key is brought on with Yallah's Point. Then you may haul to the westward, if the wind will permit. But if you should not keep up the leading mark, and the church steeple should come near the corner of the fort, you must then come to, or tack and stand in. The mark, when ashore on the Turtle Heads, is the church steeple upon the magazine of the fort, and Spanish Town Land just open.

When Maiden Key is open a ship's length to the southward of Drunken Man's Key, you will be to the southward of the South Knolls, and should bring the Leading Notch in a line with the magazine, which will bring you close to the westward of the Little Portuguese, in 8 or 9 fathoms: when Yallah's Hill comes to the southward of South Key, you are then clear of the Portuguese, and may haul to the S. E., giving South Key a berth of about a mile.

Drunken Man's Key is a narrow ledge of rocks just above water, covered with some

loose sand, that gives it the appearance of a sand bank. To the southward of it, about half a mile, there is a shoal which breaks with strong sea breezes; and between it and Drunken Man's Key is a channel, having 6 or 7 fathoms of water.

The Turtle Heads are three dangerous spots, with 10 or 11 feet of water on their shoalest part, and deep water close to them. The South Knolls to the S. E. of these heads, are two small patches, about 70 fathoms asunder, with 23 feet water on them. And to the S. by W. of these lies One-Bush Reef, which always breaks, and is almost steep to. The Three-Fathom Bank is a large coral shoal, with 19 or 20 feet of water, which breaks with strong sea breezes. A small patch, about a quarter of a mile to the S. S. E. of it, has 20 feet of water; it is called the Warrior's Bank, from the British ship Warrior having lost her rudder there in 1782.

The Little Portuguese is the southernmost shoal on the eastern side of the south channel. It has from 22 to 39 feet water over it, and in general, a great swell.

When Portland makes as an island, open about three-quarters of a point, or a point, with Hellshire, you will be to the southward of the Three-Fathom Bank and Warrior.

It frequently happens that the land breeze fails before a ship can get clear of the channel; and there is sometimes a long interval of calm between the land and sea breezes. Should this occur, it will be requisite to anchor so soon as the breeze fails, or there will be danger of being set, by the swell, on the Three-Fathom Bank, or One-Bush Reef. By inattention to this precaution, there have been instances of ships slipping or cutting their cables, when the sea breeze has come on, and running into Port Royal to save the ship.

The best anchorage is within the length of the Little Portuguese, with the leading notch a little open to the eastward of the magazine of Fort Augusta. Then, if the wind changes southerly, a ship may easily return to Port Royal, or, with the common sea breeze, may proceed to sea.

When clear of the channel, if bound to leeward, you may steer S. by W., or not farther to westward than half a point more westerly, in order to avoid some shoal spots that lie to the south-eastward of Wreck Reef.

Wreck Reef always breaks. This danger lies about a mile, or little more, to the S. E. from Hellshire Point, and is about a mile in length from N. E. to S. W. There is a channel for small craft between it and Hellshire Point. About a mile to the S. W. of the reef, there is a shoal spot of 3½ fathoms, with 7 fathoms around it.

To sail through with the sea breeze.—Ships of war, or those that sail well, may safely proceed to sea from Port Royal, if they can lay S. by E., or a little to the eastward of it, if the foregoing precautions be strictly attended to. When through the channel, soundings will be found of 10 and 11 fathoms, if steering S. by W., until Portland bears W. N. W.

The shoals in general, when the sea breeze prevails, may be distinctly seen from the mast-head. They appear of a brownish color, being covered with large branches of coral. The greatest part of them are very steep, having a depth of several fathoms close to them. The bottom of the channels between is mostly soft mud or clay.

SHIPS BOUND TO WINDWARD from Port Royal, if they can weather the Middle Ground by the time the sea breeze comes on, may pass through the Eastern, or Windward Channel, and thus they may gain 6 or 7 miles more to windward than by going through the South Channel. Small sloop-rigged vessels generally pass this way; but to others it is hazardous; because, if the land breeze fails, with an interval of calm, a swell may come on ahead, and be extremely dangerous.

NEW CHANNEL of Port Royal.—The New Channel lies to the eastward of the South Channel, and almost parallel to it; it is certainly preferable, on many accounts, to the South Channel; it has smooth water till you come to South Key, with good anchoring ground, easy riding, and a facility of going to sea to the southward with the sea breeze, as far as S. E., &c.

The leading mark to enter this channel is, a remarkable flat hummock on the mountain to the N. N. W. of Port Royal. When the middle of this hummock is in a direct line with the white house standing to the N. W. of Fort Augusta, it leads to the westward of the harbor and Point Knolls, as well as between the east edge of the Western Middle Ground, and the west end of Rackham's Key Shoal. Steer with these marks on till a remarkable round hillock, to the westward of Stony Hill Barracks, comes open to the eastward of Gun Key.

After you have opened this hummock, you steer away to the southward, keeping it open till a saddle in the mountains to the N. W. comes in a line with Fort Small, Then you bring the same hummock on the centre, or west edge of Gun Key; which marks carry you to the westward of the shoals on the east side of the channel, and about a quarter of a mile to the eastward of the Great Portuguese. So soon as Portland appears like an island, you may haul to the eastward, being clear of the reef and shoals of South Key.

The shoals in this channel are, 1. The Western Middle Ground, (on the east side of which there is a buoy,) and the small shoals to the southward of this ground.

2. The Great Bay Shoal, which has 16 feet least water, and a floating beacon in 18 feet.

3. The Four-Fathom Knoll, a very small spot, with no less than 24 feet water on it, and deep water all round. Ships of 20 feet draft may sail over it, as the water is smooth.

Between Great Bay Shoal and South Key Breakers, there are two shoals; the northernmost, at about half a mile S. by W. from the former, is steep, and a small part of it appears just above the surface of the water. This shoal always shows itself by the rippling on it. About half way between this and the breakers lies the second shoal, having only 16 feet of water.

The South Key Breakers have a buoy upon them. The marks for the west edge of this reef are, the leading notch open a little to the eastward of the capstan-house, and a saddle mountain to the N. W. and Fort Small in one.

Half a mile to the southward of these breakers is the Eighteen-Feet Reef, remarkable by the great swell upon it. To the westward of that reef lies the Great Portuguese, which is the southernmost shoal on the west side of the channel.*

OLD HARBOR, LONG'S WHARF, &c.—Mr. Leard's directions for these harbors are as follow: Being clear of the South, or New Channels, steer to the southward, or S. by W., and give Wreck Reef a berth of two miles; and then edge away, and bring the fall of Braziletto Hill to bear W. ¾ N., or W. by N., and steer for it; this will lead you to the southward of the foul ground off the Pelican Keys;† and as you approach them, you will see Pigeon Island, which is low and bushy, in a direction of the fall of Braziletto Hill; keep it so, and pass the Pelican Keys in 7½, 7, and 6½ fathoms; and, as you steer down with those marks on, you will see a remarkable hummock on the mountain to the northward, called Cudjoe Hill: (it is like a jockey's cap.) When this hummock comes on the west extremity of the slant fall of Goat Island, and will bear N. ½ W., then haul to the N. W. by N., for Old Harbor. This last mark leads you clear to westward of Dry Shoal, part of which is even with the surface of the water, and you will see it. You will have from 6½ to 6, or 5½ fathoms; and, after you have passed Dry Shoal, continue steering N. W. by N., and you will deepen your water to 8 fathoms.

And as you approach Careening Key, will shoalen it to seven and six fathoms. You must give Careening Key a berth of nearly half a mile, to avoid a reef that runs from it to the south-east; and steer direct for the wharfs at Old Harbor, and anchor in 4½ or 4 fathoms, keeping clear of the reef on the south side of the harbor, which generally shows itself.

Long's Wharf and Salt River.—If you are bound to Long's Wharf, in sailing to the northward of Pigeon Island, there is a small white shoal of only 18 feet on it; it shoalens gradually on the east end, and bears north from Pigeon Island, distance one mile. The south edge of Round Hill, just open with Braziletto Hill, leads on it. You may sail between this shoal and Pigeon Island, in 8, 7, 6, or 5 fathoms; but to the northward is the straightest course. After passing Pigeon Island, steer to the north-west, and bring the top house about one-third from the north side of the large opening or gap in the mountains; this mark leads between the reefs to the anchorage at Long's Wharf, in 4 or 3½ fathoms.

Salt River Anchorage.—If you are bound to Salt River, after passing Pigeon Island, keep the south part of Braziletto Hill open a little on your larboard bow, which will lead you close to Salt Island; you may go either to the northward or southward of Salt Island, but the north passage is the best. You may pass within a cable and a half's distance of Salt Island, on the north and west part: on the south part is a reef which shows itself, and is steep close to it. There is a reef extending along on the east side of Long Island, which you see; and also a reef extending from the Salt River shore to the eastward, which sometimes breaks. Therefore, steer round the north end of Salt Island, at about two or two and a half cables' distance from it; and then steer towards the entrance of Salt River, until you bring the south edge of Pigeon Island almost in a line with the south edge of Salt Island: keep them in that direction, and when you are in 4½, 4, or 3½

* The preceding description of, and directions for, the South Channels, may be considered as more for the use of the pilot, than of the general navigator. Captain Livingston has said, "I think the Derrotero is right in omitting directions for any of the channels at Port Royal, Jamaica, excepting the eastern one, as directions for the Southern Channels are absolutely useless: because no one who is unacquainted ought to be fool hardy enough to attempt carrying any vessel in or out, except by the Eastern Channel, even with the most correct instructions and most accurate chart."

† The most frequented and best channel for entering into this great bay is between Pelican and Bare-Bush Keys; and to take it, those who come from Cow Point must steer W. S. W. ¼ W., 9 leagues, and until the slope of the Braziletto Mountain bears W. by N. With this mark and bearing you proceed to Pigeon Island, &c. The Braziletto Mountain cannot be mistaken; it being the northernmost of the two, which are seen to the west, and the southern is of a round shape. The opening which these mountains forms is the point to be used as the leading mark, bearing W. by N., as above.—*Derrotero, &c.*

fathoms, anchor, according to the size of your ship. If you are in a low vessel, it will be necessary to go a little up the shrouds, to see Pigeon Island over Salt Island. The south end of Pigeon Island, a little open to the southward of Salt Island, leads on the edge of the Salt River Reef. There is good anchorage under the west part of Salt Island, in five fathoms and a half, good holding ground.

Peake Bay.—To sail into this bay, give the reef that runs off Rocky Point, a berth of a cable's length, or more, and steer towards the north part of the sandy beach, and anchor in 4½, 4, or 3½ fathoms, good holding ground. The reef off Rocky Point, and the reef on the south side of the bay, are nearly even with the surface of the water, so that you generally see them. There is a great sea in this bay, with strong sea breezes.

West Harbor.—The entrance into this harbor is between two coral reefs, that are nearly even with the surface of the water; and the heads of coral frequently show above water. The channel between the reefs is above half a mile wide, with 6 and 6½ fathoms in it. There is very good anchorage, with smooth water, just to the westward of the north reef, in 5½, 5, or 4 fathoms, good holding ground. The land to the westward does not show any mark that I could find to guide you into this anchorage, but it is not difficult. As you go to the westward in the west harbor, the water shoalens to 8 or 9 feet. It is also shoal on the south side, towards the mangroves, and smooth water.

Going to Sea from Old Harbor, Long's Wharf, &c.—Ships generally get under way with the land wind, so as to get clear of the reefs near the anchorage, before the sea breeze comes on. Being clear of the reefs, you may turn out with the sea breeze, and may go on either side of Pigeon Island. The channel between Pigeon Island and the reef of the Half Moon Keys is two miles wide, with deep water; but the smoothest water is to the northward of Pigeon Island. You may stand towards Goat Island and Cabarita Point, by your lead: the soundings are gradual, and tack when you come to 5 or 4½ fathoms. If the sea breeze should be very strong, you may anchor under Dry Shoal, and wait for the land wind. But, with moderate sea breezes, any ship may turn out between the keys and reefs. Being as far to the eastward as Dry Shoal, and in standing to the southward, your leading mark for the channel between Bare-Bush Key and Morris' Shoal, is Cudjoe Hill, on the slant fall of Goat Island, the same as for Dry Shoal; keep it so until the Half Moon Keys come in one; then you are to the eastward of Morris' Shoal, and may edge away a little, keeping the Cudjoe Hill about a large sail's breadth on the lower part from the slant of Goat Island, which mark will lead you along the white water on Bare-Bush side to sea. But if, in standing to the southward from Dry Shoal, you find that you cannot weather Morris' Shoal,* which you will know by the fall of Cudjoe Hill not being within a sail's breadth of the fall of Goat Island; in this case you must tack to the northward, when Bare-Bush Key bears E. S. E., or when a saddle hill to the north-west of Pigeon Island is just coming on the north end of Pigeon Island. And, in standing to the northward, tack when the fall of Braziletto Hill comes on the centre, or near the north end of Pigeon Island; you may approach the white water on the side of Bare-Bush, to 5 fathoms. There is a good channel between Morris' Shoal and Half Moon Keys; but it is dangerous to approach the latter on the south-east side, for you will have from 6 or 7 fathoms to 12 feet, in one or two casts of the lead. To the E. S. E. and S. E. of Bare-Bush Key, distant about one mile, are some spots of coral, with from 3½ to 5 fathoms on them, and 7 fathoms close to them. And to the southward and S. S. E. of the Portland Keys, distant about two miles, are some spots of 3½ and 4 fathoms on them. After you have passed those keys in sailing to the westward, come no nearer Portland than two or two and a half miles, or 7 or 8 fathoms; for, the reef off Rocky Point, which is the west part of Portland, extends nearly two miles from the point to the southward.

PORT ROYAL TO PORTLAND.—In proceeding towards Portland, observe that Wreck Reef, which is a large shoal composed of dry rocks and breakers, lies about half way between Port Royal and Old Harbor, at the distance of more than a mile from the shore. This danger, which appears in the day, consists of two parts, having between them a channel of 4 fathoms water. Ships passing in the night should approach no nearer than in 12 fathoms, or come to an anchorage until morning. Within the reef there is good shelter, and tolerable anchorage, in 4 and 5 fathoms, bottom of sand, with shells and mud. Here vessels occasionally ride during the prevalence of a breeze, &c.

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* It is said, that about thirty years ago, ships sailed over this shoal; if so, it must have grown fast, for there is not at present, more than 9 or 10 feet on the north edge of it, and a great swell in general. Marks for the east end of it; Cudjoe Hill, about half way from the fall of Goat Island, upon the low and bushy land towards the rising to the westward; (this rising is commonly called Little Goat Island;) and the Half Moon Keys about four degrees open, and north part of Bare-Bush Key bearing E. ¾ S. Marks for the west end are, Cudjoe Hill, on the afore-mentioned rising of Little Goat Island, and Bare-Bush Key bearing E. ¾ S. It is in length little more than a quarter of a mile, and in breadth about one-sixth of a mile, and shoalens too sudden for your lead to be a guide in standing towards it.

From Port Royal to Portland, the distance, on a circuitous course, is 9 leagues. In this track, when clear of the South Channel, give Wreck Reef a berth of 2 miles.

There are soundings outward as far as with the easternmost land of Hellshire, bearing N. ½ E., and Rocky Point, or the southernmost land of Portland, N. W. ½ N. With these bearings, soundings have been found of from 17 to 23 fathoms, and the next cast no ground at 80 fathoms, although not a ship's length from the former.

The Pedro Keys; from the Remarks of H. M. S. Winchester, Captain, the Hon. W. Wellesley, R. N.

THE PORTLAND ROCK is elevated from 15 to 20 feet above the level of the sea. The Winchester rounded it on the south side, and brought it to bear east, carrying from 10 to 14 fathoms water, on a sandy bottom, with pieces of coral. In this bearing a vessel might anchor with safety in moderate weather.

We made the latitude.....17° 7′ 23″ N.
——————— longitude .....77 25 20 W.

which is only 20″ different from De Mayne's meridian distance reduced; he having considered Port Royal in 76° 52′ 38″ W., whilst we used 76° 49′ W.

We stood from the Portland Rock to the S. W., carrying from 12 to 15 fathoms, and having these soundings farther to the southward, than laid down by the chart. We saw the Eastern Breakers, so called by De Mayne: they appeared to have an extent of about two cables' length, with two small rocks above water, and were breaking in all quarters.

Near these the water shoaled to 8 fathoms and a half; and when they (the rocks) bore N. N. E., distant 4 miles, we had only 7½ fathoms, the Pedro Keys just then coming in sight. Steering W. by S., we soon after had no bottom, having got into the indent, as shown in De Mayne's chart, so that the shoalest water we had must have been very near the edge of the bank.

We did not go nearer than a mile and a half to the eastward of the Pedro Keys, and had no soundings with the hand-lead; but the chronometers gave the centre of the middle key 77° 47′ 13″ W., or 58° 13″ west of Port Royal.

THE SOUTH-WEST BREAKERS.—They are dangerous, and require a strict lookout. The sea breaks over two small rocks, not more than three feet above the level of the sea, constantly, but so irregularly, that from the deck of a vessel, and in a moderate breeze, a high breaker might not be distinguishable oftener than once in 5 minutes, and the ordinary ones would be taken for waves. In the Winchester, with a good masthead lookout, we passed within three miles of these, without their being discovered.

On the west side they are bold to. Having stood to the northward on the bank, passing them at the above named distance, we carried 11, 12, and 10 fathoms for six miles. When the breaker bore S. S. W. about that distance, we tacked, and stood for it; and when about three miles distant, the soundings became irregular, varying from 11 to 8½ fathoms.

We were at noon as near to it as one mile, bearing east, and we had not less than nine fathoms.

The whole breaking part does not extend more than 1 or 1½ cable's length; but it is to be supposed there is foul ground to the eastward of it for a mile or so. The ocean color of the water above it was remarkable even in soundings, and I should be for this reason cautious in approaching it to the eastward.

Latitude of South-West Breaker.....16° 47′ 56″ N.
Longitude of do .....78 10 32 W.

or 1° 21′ 32″ west of meridian of Port Royal, which is nearly a mile to the eastward of De Mayne's reduced.

The Pedro Shoals (Bivora Bank of the Spaniards) have been regularly surveyed, and the representation of them in the charts is to be relied on. Of the Cascabel, or Rattlesnake, which is supposed to distinguish the N. W. end of the Pedro Bank, it does not exist, as there has been an accurate survey of the bank, and it was not to be found.

CARLISLE, OR WITHY-WOOD BAY, to the west of Portland, is an open bay; winds from W. to S. E. Its S. E. extremity is the rocky point of Portland, from which a spit, of 12 feet of water, extends about three-quarters of a mile to the S. W. Westward of Rocky Point is a bank, called Robertson's Shoal, on some part of which there are only 6 feet at low water. The outer edge of this shoal is one mile and a half west from Rocky Point. The form of the shoal is nearly oval, from E. to W. Its breadth, N. and S., is three quarters of a mile.

To sail into the bay, bring a remarkable round hill to bear nearly north, and steer for it, until Rocky Point comes almost on with the east point of Portland. Hence, rounding Robertson's Shoal, you may come to an anchor in from 5 to 4 fathoms. With the hill above mentioned N. by E., there is a spot of 3½ fathoms, at about 2½ miles from the

beach. With the fort N. E., or N. N. E., is the best place to anchor in for loading, because your boats can sail both ashore and aboard with the sea winds. No tides here, but a strong westerly current generally runs in the offing. Var. 6° 50′ E.

Along the coast to the westward, to the distance of nearly twenty miles from Carlisle Bay, at a mile or a mile and a half from shore, there is a regular depth of 4 and 4½ fathoms.

ALLIGATOR POND KEY.—Alligator Pond Key is a key just above the surface of the water, with a reef all round it. Its distance from the shore is about four miles, and vessels may approach it by the lead, or on seeing the breakers. There is good anchorage for small vessels along shore, between it and the main, in 3 and 4 fathoms.

BRUNE BANK, a small bank, having on it little more than 4 fathoms, with 12 or 13 close to it, lies six miles S. E. by compass, from Alligator Pond Key. The shoal is about a mile and three-quarters in extent, from east to west, and one mile and a half in breadth: it has from 4 to 6 fathoms water on it, and the outer edge is about 8 miles from the shore.

PEDRO BAY, &c.—In Pedro Bay, to the westward of Pedro Bluff, there is good anchorage for any vessels, but it is open to southerly winds. The lead is here the best guide for anchoring. The coast hence to the westward, nearly to Parratee Point, is bold to. Off Parratee Point is a small reef; and to the N. W. of this point is Black River, which is formed by extensive reefs. To clear these reefs, keep Pedro Bluff open with Parratee Point.

The entrance of Black River is between two reefs, and has not more than 8 feet water. To sail into the river, when advancing from the eastward, keep Pedro Bluff open of Parratee Point, till you bring the church on with a gap in the highland, or to bear N. E.; then steer directly for the church, which will carry you into the best of the channel. It is full of heads of coral rocks.

PORT ROYAL TO BLACK RIVER; by Mr. Town, 1817.—On leaving the South Channel of Port Royal, when bound to the westward, you may clear Wreck Reef by keeping the Magazine of Fort Johnson open of St. George's Rocks, until Portland bears west; thence you may alter your course along the land, as there are no dangers to be apprehended, until you approach Alligator Key, about 4 miles S. E. ½ E, from which is the Brune Reef, already described.

Pedro Bluff is very remarkable, and may be known from any other land on the coast. At 4 or 5 miles to the eastward of the bluff, there is a remarkable white spot in the cliff called the White Horses, which, when you first make it from the eastward, appears like a schooner under sail, close to the land.

From Parratee Point to Luana Point, the bearing and distance are N. W. by W. ¼ W. 9 miles. The coast between forms the bay of Black River, which is obstructed by a number of reefs, all of which lie within the line of the two exterior points, and a course N. W. by W. ½ W. will therefore lead clear of them. The bay does not appear to have been regularly surveyed. The main channel, which is between two reefs, has only 18 feet of water.

If going to Black River, or its bay, when advancing towards Parratee Point, take care not to approach the point nearer than one mile, as there is a reef extending off to the S. W. nearly a mile. Your leading marks into this bay, to the anchorage where merchant ships load, will be the church just open to the eastward of a large cotton-tree: run in with this mark, until you are within half a mile of the town, and anchor in about 18 feet. Large ships, that cannot approach so near the town, should anchor under the eastern shore, in 8 or 9 fathoms. Your best mark for anchoring is, Pedro Bluff shut in about a cable's length of Parratee Point, in 9½ fathoms, with the town bearing about N. E. by E. ½ E. There is a very dangerous reef lying on the western side of this bay, with only 4 feet of water on the shoalest part. There is also a coral bank, nearly in the middle of the bay, with only 2½ fathoms over the shoalest part.

From Luana Point, the coast continues clear for a league and a half to the N. W., but it thence becomes foul, and so continues to Bluefields' Bay, &c. The direct course and distance, clear of danger, from Luana Point to South Negril, the S. W. end of Jamaica, are W. N. W. ½ W. nearly 10 leagues.

*BLUEFIELD'S BAY.—This part of the coast is environed by reefs, and the anchorage here for large ships is without a rocky ledge, which stretches from Crab Pond Point to the west of Bluefields', and joins the reef of Savanna la Mar. Vessels coming from the eastward, to anchor in the bay, must keep down by the outside of the reef, or keep the land to the eastward open of the point, until the leading-mark is brought on, which is the overseer's house, a little open to the eastward of the tavern, bearing N. E. by E. ½ E. For anchoring, bring the overseer's house and tavern in a line, N. E. by E. ½ E., and the easternmost point E. S. E. Ships drawing 16 or 17 feet water, may

* South 4 leagues from Bluefields, lies a rocky bank, discovered in 1821, with from 13 to 20 fathoms on it.

sail over the rocky ledge, in 3¾ or 4 fathoms, with the overseer's house and tavern as above, until over the ledge, which may be known by finding a sandy bottom; and a depth of 5½ or 6 fathoms. The watering place is to the northward of the Bluff Point, on the lee side of the bay. Water may also be obtained at a stream off Bluefield's River, near the tavern.

In steering in, keep the lead going, and be ready to anchor, as the water shoalens rather suddenly.

SAVANNA LA MAR.—The coast from Bluefields to Savanna la Mar is rocky, in some places, to the distance of two miles from the shore. The entrance to Savanna la Mar is very narrow, and lies between a small reef called the Middle Ground, (on which there is a depth of only 4 feet,) and another reef having 7 or 8 feet over it. In the channel there is a depth of 19 or 20 feet. The leading mark in, is a large gap on the highland, called the Dolphin Head, in a line with a remarkable large tree on the lowland, to the eastward of the town, and bearing N. ¾ W. This mark leads close to the Middle Ground, which will be seen. After passing the latter, haul to the eastward, and anchor in 17, 16, or 15 feet of water. This channel should never be attempted without a pilot.

A mile and a half to the westward of the former channel, is the Great Channel of Savanna la Mar, which is a mile in breadth, and has a depth of 24 to 19 and 13 feet towards the shore. To sail through, in mid-channel, it is only requisite to bring the fort on, bearing N. N. E.

On the southern extremity of the bank extending from shore, between Savanna la Mar and John's Point, the British ship Monarch struck, in 1782, upon a bottom of coral. This extremity lies with John's Point bearing N. W. by W. ½ W., and will be avoided by keeping one-half of the high land of South Negril open to the southward of John's Point.

In traversing hereabout, it is necessary to be very particular in the use of the lead, for the bank, which extends along the front of Bluefields, and thence to opposite Savanna la Mar, &c. is rocky, and has, on its edge, from 20 to 24 feet of water; and on it as on the White Banks, there are many shoals with little water on them, some of which uncover, and many have breakers. Without the edge of the reef, and very near to it, are 5 fathoms of water, which augments to 13 fathoms at three-quarters of a mile from the edge of the bank: the depth, therefore, is the best guide, for, when you get from 8 to 10 fathoms, you will be from one-third to half a mile from the edge of the reef; and when you get 13 fathoms you will be three-quarters of a mile from it; and, pursuing your route, you should not keep in the depth of 8 or 10 fathoms, but in that of 13 to 15; for only in the vicinity of the anchorage they are for taking, should vessels get into the first of these depths. The anchorage of Savanna la Mar is of the same nature as that of Bluefields: large ships must anchor outside of the reef, and, in such a situation, they will not be sheltered from the sea, from east round to S. by W. It seems probable that such will very seldom come to this place, because they here run much risk of losing their anchors; as the instant there is the least appearance of the wind freshening, they must make sail. Such vessels as do not draw more than 12 or 13 feet of water may anchor upon the bank, and behind, (or in the lee of the reefs,) in 15 or 16 feet of water, with the town bearing N. N. W. ½ W., nearly three-quarters of a mile distant. You may cross over the edge of the bank so soon as the wharves at Savanna la Mar bear N. W. by W., which will be three-quarters of a mile to windward of the Eastern Channel, (that is, if the vessel is on the edge of the reef, or near it,) and sending a boat to be placed to the westward of the Middle Ground; it will serve for a guide and buoy: and then you have only to shave close to the boat, as the mean to keep clear of the reef to leeward. The boat may proceed with the leading mark as above, or may steer northerly until she comes to the edge of the reef, which runs along to the east of the anchorage; and, keeping along the southern edge of this reef, she must thence steer N. W. ½ N. so soon as the wharf of Savanna la Mar bears on that rhumb; with this course she will pass over the rock.

WESTERN END OF JAMAICA.—From St. John's Point to South Negril, the coast is bold to, or high and steep. The indent between South and North Negril, is called Negril, or Long Bay, and affords tolerable anchorage. Close to the south side of North Negril, is Negril Harbor, a small harbor with good anchoring ground for small vessels; and, to the north are Orange Bay and Half-moon Bay, places fit for Drogers, &c. Six miles to the N. E. from North Negril is Green Island Harbor, and about 2½ miles from the latter, is Davis Cove. These are places seldom resorted to, but by those who go thither on purpose to load, and have pilots.*

Between Negril and North Pedro the coast is bold, excepting at Green Island, which

* A rock, with 24 feet water on it, was seen some years since by one of the ships in a convoy lying to, about, as well as I can recollect, 40 miles west of Negril Point, Jamaica: and I am pretty certain it was in lat. 18° 24′. It was noticed in public orders at Port Royal.

is low, and environed by a reef, nearly even with the water. From Pedro Point to the harbor of Lucea, vessels may stand within a mile of the shore.

Mr. Town says, a ship being off the west end of Jamaica, and bound to any port on the north side, should endeavor to round the points called South and North Negril, as close as she can: for the current, in general, sets to the N. E. If proceeding for the Harbor of Lucea, you may know its entrance by a remarkable notch in the mountain, called the Dolphin Head. At a little to the westward of the harbor there is, also, a remarkable white spot in the land, which may be seen eight or ten miles off.

HARBOR OF LUCEA.—This harbor is one of the best on the north side of the island. It is safe, there being little danger in sailing in or out. The N. E. point is called Lucea Point, and on the western point stands the fort. Vessels, having opened the harbor, stand directly in, only giving the Fort Point, on the western side, a berth, as a reef stretches from it, on the extremity of which there is generally a buoy. To sail in, bring the remarkable mountain, called the Dolphin Head, open to the westward of Barbara Hill, which has a house on the top of it, and is on the east side of the harbor, bearing nearly S. by E. Continue on in this direction, until the fort bears west, when you will be within the Fort Reef Hence proceed towards the town on the west, and anchor in 5 or 6 fathoms, muddy bottom, with the fort bearing from N. by W. to N. N. W., and Lucea Point, at the eastern side of the entrance, from N. N. E. to N. N. E. ½ E.

Those approaching this place from the eastward, must observe to keep at least three miles from shore, until past Buckner's Reef, which lies off Mosquito Cove, and sometimes breaks. It is also to be observed that, around Lucea Point, and to the north-eastward, there is a rocky flat, extending out to a considerable distance.

Within the point the reef extends to a cable's length from shore. It is nearly steep to, and the heads of coral sometimes appear above water.

For passing clear of the edge of the eastern bank, the mark is Malcolm House, which stands on a small hill or rising at the east end of Lucea Town, brought on the east end of the fort, and kept so until you bring the Dolphin Head, as already mentioned, to the westward of Barbara Hill. This mark leads through 8, 7, and 6 fathoms, then deepening to 13, and shoaling again into the harbor.

MOSQUITO COVE, an excellent harbor, lies three and a half miles to the eastward of the harbor of Lucea. Here a hundred sail of merchant ships may lie securely from all winds. The channel, at the entrance, is little more than a cable's length in breadth, but widens inward to where the harbor has from 7 to 4½ fathoms. The bottom, in general, is muddy. To sail in you may pass to the eastward of Buckner's Reef, or over its eastern end, in 5½ or 6 fathoms. The course into Mosquito Cove is nearly S. E. by S., but it should not be attempted by a stranger without great caution, as the entrance is much contracted by a reef from the eastern side.

MONTEGO BAY.—The northern point of Montego Bay lies in latitude 18° 32½′. This is a good bay with the wind from N. N. E. to the eastward and southward; but it is open to the north and west; and the northerly wind, in December and January, has frequently driven vessels on shore.

To sail in from the eastward, give the point, on coming down, a berth of two miles, in order to avoid a reef which extends from it, and which may be distinctly seen from the bows, when in 4 or 5 fathoms. When you open the town you may approach the reef, which is pretty steep, into 10, 9, or 8 fathoms, and will see the bottom. You now haul round towards the town, but must not venture to anchor until you have well shut in Sandy Point, (without the bay on the north,) with Old Fort Point. For, with Sandy Point in sight, there are from 35 to 30 fathoms, and the bank is so steep that the anchor will not hold. If a ship drives off she will, with a sea breeze, be in danger of grounding on the lee reefs. The mark for the best anchorage is, the barracks upon the hill in a line, or nearly so, with Redwick's Stone Wharf, on the N. E. side of the bay. The ground here is good in 11, 10, and 9 fathoms. On entering from the westward with a fair wind, the church bearing east leads directly to the anchorage.

The following descriptions and directions, are those of Mr. Town; Montego Bay affords good anchorage for 20 or 30 vessels, except during the prevalence of strong north winds, which generally commence in the beginning of November, and end in the latter end of February. With the general trade wind, which is from the N. E. to the E. N. E., ships will ride here with perfect safety. There is a small harbor, or cove, in the N. E. part of the bay, which will hold from 10 to 12 vessels. This is the only safe place for ships during the strong north winds.

On coming into this bay with the sea breeze, which is from N. E. to E. N. E., you should endeavor to get well to the eastward before you attempt to run in.

The leading mark for clearing the Old Fort Reef, which extends from the anchorage in the bay to the northward of the northernmost point, is the Boge Road end on, bearing south, or south a little westerly. Proceed with this mark until Montego Church comes open of Old Fort Point; then haul in for the S. E. part of the town, and when Sandy Point is shut in with Old Fort Point, you may anchor in from 17 to 10 fathoms,

fine sand and mud. The reef off and to the northward of Old Fort Point, lies nearly one mile and a quarter from the shore; advance, therefore, no nearer to the point northward of Old Fort Point than two miles.

About 5 miles to the westward of Montego Bay is a small creek, a bay without, which is called Great Roads. In this bay merchant vessels lay to load; there being a shoal extending nearly the whole of the way across, which affords good shelter for ships lying here during the north winds.

All ships lying either in Montego Bay or at Great Roads, pay harbor dues, at the rate of one shilling per ton, register tonnage; and in the event of any ships going into the Inner Harbor, at Montego Bay, she is charged one half-penny per ton for every day that she may lie in this harbor, in addition to the fee that is paid for anchoring in the bay.

If bound from Montego Bay to the eastward, I would recommend leaving the bay in the evening, so soon as the land wind comes off, which will generally run you clear of the bay, and in a good offing for the sea breeze. It is generally recommended to beat to windward close to the land, in order to have the advantage of the eastern currents; but I am of opinion that the only advantage you have by keeping in shore is, that you meet the land wind, which sometimes will carry you well to the eastward during the night, for the current sets to the westward as often as to the eastward. If your destination be Falmouth Harbor, endeavor, if by night, to keep the shore close aboard, and the land wind will lead you to the eastward.

PEAK OF TARQUINO.—In working hence to windward, in clear weather, when Cuba is visible, a remarkable hill will be discerned. This is the Pico de Tarquino, the highest land on this side of Cuba, which bears from Montego Point N. E. $\frac{3}{4}$ N., distant 35 leagues; from St. Anne's Bay, N. by E., 28$\frac{1}{2}$ leagues; and from the east end of Jamaica, N. N. W., 40 leagues, by which you may judge how far you are to windward on any other bearings. The Peak of Tarquino, &c., have already been described.

FALMOUTH HARBOR, OR MARTHA BRAE.—This harbor, which lies 6 leagues to the eastward of Montego Bay, is a bar harbor. Its channel, or entrance, is very narrow, not more than 16 or 17 feet in depth, and too intricate to be attempted without a pilot. The town of Falmouth is situate on the western side of the harbor, throughout the greatest part of which there is a regular depth of from 5 to 10 fathoms.

MARABONA BAY.—At about 3 leagues to the eastward of Falmouth is Marabona Bay, which is very remarkable. It has a low pleasant plantation close to it; and on the hill over it is a large house or castle, formerly the residence of Brian Edwards, Esq., historian of the West Indies. Within a league to the eastward of this, is the small harbor of Rio Bueno.

RIO BUENO AND DRY HARBOR.—Rio Bueno, which lies nearly 4 leagues to the eastward of Falmouth, is a bay exposed to all winds between N. and W. N. W., and has but indifferent anchorage, the bank being steep. It is seldom visited by other than merchant vessels, which go there to load. From the entrance to the place of anchorage, the distance is about 2 miles. The harbor is formed by two reefs. A ship may lie with the point N. N. W. $\frac{1}{2}$ W., in 9, 8, or 7 fathoms. Dry Harbor, which lies 3 miles more to the eastward, is, however, a good harbor for small vessels, although its channel be narrow, and has a depth of only 16 feet.

ST. ANNE'S BAY.—The entrance of this bay lies in lat. 18° 31′, long. 77° 15′. It is narrow, and lies between two reefs, which have on their ridges 3 and 3$\frac{1}{2}$ fathoms, deepening abruptly in the channel to 10 and 11 fathoms. The entrance is less than half a cable's length in breadth, and lies with the barracks on the rise of the hill, bearing nearly S. $\frac{3}{4}$ E., but it is not to be attempted without a pilot. With a northerly wind, a stream of considerable strength sets outwards through the channel: this is occasioned by the great quantity of water thrown over the reefs by the swell. In passing in, as the water is clear, vessels generally pass close to the western reef, on the starboard side.

Mr. Town says, St. Anne's Bay lies about 12 miles to the eastward of Dry Harbor. This bay may be known by its having a very regular row of cocoanut trees around it, close to the water's edge, and the town of St. Anne, which stands on the side of a hill on the S. E. side of the bay. The houses stand close to the water's edge on the western side, and the plantations are, in appearance, in a state of cultivation much superior to any westward of this place. The harbor of St. Anne is small, and is close to the town. You may anchor here in from 6 to 9 fathoms, good ground.

OCHO RIOS, which lies 7 miles to the eastward of St. Anne's, is an anchorage open to the north and N. W. winds. To enter, you sail by a reef which spits off from the eastern side of the bay, hauling up and bringing the westernmost part of it N. N. W. $\frac{1}{2}$ W. to N. W., in 7 fathoms. There is another reef to the southward, but, as the water is very clear, it will be seen. This is a small harbor, frequented by merchant vessels only, which go there to load.

ORA CABECA, 10 miles to the eastward of Ocho Rios, is another anchorage, exposed like the former to north and N. W. winds. To sail in here when advancing from the eastward, first make Galina Point; in order to which, when off at sea, bring the western-

most high land of the Blue Mountains S. S. E., which, thus kept on, will lead to the point. To anchor, give the small reef on the east side a berth, and when the westernmost bluff point bears W., or W. by N., anchor in 5½, 6, or 7 fathoms.

Captain Livingston says, it is not generally known that in Allan's Hole, which is formed by reefs level with the water on the one side, and the eastern shore of the bay on the other side, vessels drawing from 10 to 12 feet may lie as secure as in any harbor in Jamaica. When once inside the reefs the bottom is quite clear, and the reefs completely break the sea off. Vessels drawing not more than 12 feet of water may warp into this place. At the north end of the reef is an islet, with bushes on it, divided from the main land by a narrow and shallow channel. Allan's Hole has two entrances; one through the reef, which is extremely narrow, and one by the point of the reef: but neither ought to be attempted without a pilot.

GALINA POINT lies 4 miles to the eastward of Ora Cabeca. This point is low, but the land to the southward of it is high; and in making it from the westward, a remarkable round hill that stands within the point, will, on its first appearance, form the point; but, on a nearer approach, the land slopes off to the northward to a low point.

PORT MARIA.—The entrance of this harbor lies in lat. 18° 27′, and long. 76° 53′. Its anchorage is open to N. N. E., N., and N. W. winds. In coming in, the high island, named Cabarita Island, must be seen, and its northern point should have a berth of two cables' length. You may haul into the bay, and anchor with the N. W. point of the island N. E., or N. E. by N., at the distance of about a cable or a cable and a half's length. Small vessels drawing 10 feet of water, may anchor between the island and the main. The bottom is foul in the outer part of the bay, and many ships have injured it by heaving over their ballast. There is not room for more than ten or twelve vessels to lie here, as the foul ground extends nearly over the whole harbor.

From Port Maria the coast trends E. S. E., 6 miles, to Blowing Point; thence it continues S. S. E. ½ E., about 5 miles, to Anotta Bay.

ANOTTA BAY, which lies about 11 miles to the S. E. of Port Maria, has its anchorage open to N. and N. W. winds. To sail in, give the reef on the eastern side, which is called the Schoolmaster, a sufficient berth; then steer down until you bring the tavern, a building easily known, S. by W. or S. When advanced within the Schoolmaster, haul a little to the eastward, and have the anchor clear, the bank being steep and narrow. The first sounding will be 10 or 9 fathoms. Let go in 7 fathoms, which is about a quarter of a mile from shore, with good holding ground. Be cautious of anchoring on the western edge of the bank, as it will not hold, and you may be in danger of getting on shore to the westward.*

Of Anotta Bay, Captain Livingston says, "This is the wildest road I ever saw. No vessel ought to enter it, without being uncommonly well found in ground-tackle. They ought, by all means, to have chain cables. The following is from memory only: The reef off Gibraltar Point, the Schoolmaster, is much more dangerous than is generally supposed. The late Mr. Angus M'Donald, the harbor master, informed me that it extends fully 4½ miles out; and some places have only from 6 to 9 feet of water, while there are gaps or gateways through them, with as many fathoms."

PORT ANTONIO, which lies about 8 miles from the N. E. end of Jamaica, was formerly a king's port, where there are still to be seen the remains of a careening wharf, &c. It is formed by nature into two harbors, divided by a peninsula, on which stands the town of Titchfield, to the N. and N. W. of which lies the island called Navy Island, extending E. and W., and about a half a mile in length.

To sail into the eastern harbor, first bring the eastern part of the Blue Mountains to bear about S. S. W., and steer in that direction until you approach near Folly Point,

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* A brig of war was lost on the outer reef a few years ago. I have often heard her name during my residence at the bay, but it has escaped my memory. She was so far out that no one had any suspicion that she was in the least danger; and it was only in consequence of her loss that they discovered the reefs lay so far out. Mr. M'Donald, harbor master and senior pilot at the bay, surveyed the reefs; but he informed me his survey was forwarded to Port Royal, to be produced at the trial of the officers of the brig which was lost. What I have stated above was from his information.

The earthquake felt in Jamaica, in 1811, was particularly severe at Anotta Bay. Part of the bottom of the bay, about one-quarter of a mile from the shore, sunk, and where vessels used to anchor, there is now no bottom to be found; or at least I have been assured none has been found, though I heard somebody at the bay say that it has been, at 170 fathoms. When this spot sunk, a vessel was riding, with a kedge out in that direction to steady her. In an instant, as an eye-witness assured me, she seemed as if going down stern foremost, and then suddenly rising again, swung round at once. This, it was soon discovered, was occasioned by her kedge being swallowed by the bottom of the bay when it sunk; and the sudden rise of the vessel again was caused by the hawser, bent to the kedge, giving way, or the timber to which it was attached yielding.

Anotta Bay is an extremely unhealthy place; so is Port Maria; but Ora Cabeca is a tolerably healthy situation.

the east point of the eastern harbor. Next bring the church (which is a large square building, on the side of the hill in the S. W. part of the bay) on with the second wharf from the westward, bearing S. by W. ½ W., and you will thus pass safely into the harbor. But observe that on approaching the fort, (which stands on the western side, upon the point of Titchfield Peninsula,) to open the church to the eastward of the wharf. When the fort bears N. W., you may anchor in 8, 9, 10, or 11 fathoms, good holding ground. The bottom is, indeed, so stiff, that it is rather difficult to get up the anchors.

The preceding directions must be particularly attended to, in order to avoid a reef, which stretches from the eastern end of Navy Island, as well as from the point of the peninsula. The eastern side of the harbor is shoal, and there is a reef nearly in the middle, having over it only 8 or 10 feet of water.

To sail into the western harbor, after having brought the church well open to the eastward of the fort, proceed, under easy sail, into the entrance of the channel between Navy Island and Titchfield, bringing a long building, which is a storehouse, standing on a hill to the westward, open of the south-western point of Navy Island. This mark is to be kept on until the church appears open to the westward of the peninsula; then haul round to the S. W., and anchor in from 7 to 4 fathoms, where there is good ground.

A channel, called the Hog Channel, leads directly from sea into the western harbor, from the west end of a long reef that extends from Navy Island; but it is crooked and narrow, has only 13 or 14 feet of water on the western part of it, and is therefore used only by small vessels.

The tides here are not regular, being influenced by the winds. The variation in 1771 was 7° 15′ E., and it is still nearly the same.

Of Port Antonio Mr. Town says the western harbor is the best, the eastern being open to the north winds. When entering the port, with the sea breeze, keep as nearly in mid-channel between Navy Island and the main as you can. Run in with the leading mark on, and anchor in about 6 or 7 fathoms. If in a small ship, anchor in 4 or 5 fathoms, as the ground without the latter depth is foul.

PORT MORANT.—This is a good harbor, but the reefs extend to the distance of half a mile from shore, on each side of the entrance, and the breadth of the channel between is only a cable's length and a half. As the direction of the entrance is N. ½ W., it can be attempted only with the sea breeze, or between the hours of 10 and 2 in the day. To sail in, a ship must lay N., or N. by E., until the leading mark is on. This mark is a remarkable house, which stands upon a hill, in a line with the east end of the easternmost red cliff bearing N. ½ W. With this mark you may sail into the bay with safety. Take care not to approach too near the reefs, but bring the marks exactly as described. You will thus have 9, 8, 7½, 7, 6½, 6, 5, and a quarter less 5 to 4 fathoms of water. There is anchorage in 6½ and 7 fathoms, with the leading mark on, and Pero Battery, which is on the eastern side, bearing E. S. E.

The CAYMANS are three islands lying between the meridians of 79° 30′, and 81° 35′ W., and parallels of 19° 10′, and 19° 45′ N. The larger and westernmost is named the Grand Cayman, the second, the Little Cayman, and the easternmost the Cayman Brack.

The Grand Cayman was regularly surveyed by Mr. George Gauld, in the year 1773; but that gentleman ascertained neither its true latitude nor its longitude.

The GRAND CAYMAN is about 8 leagues long, and two and a half broad. The S. E. end lies in latitude 19° 16′ N., and the N. E. point in latitude 19° 22′. The eastern end is surrounded by a reef, extending a mile and a half from shore, which thence extends along the north and south coasts. Off the S. W. point there is also a key and reefs, to which a good berth must be given. The N. W. or west point is 3 leagues from the S. W. point, and between is the spot called the Hogsties, where there is a small village, off which you may anchor in from 12 to 7 fathoms, by bringing the southernmost house to bear E. by S. at half a mile from shore. The bottom is rocky, but you may see the ground where you let go, as the water is very clear; it will, however, be proper to buoy up the cables, and steady the ship with a small anchor.

Captain Dalzel, in some observations on passing the Grand Cayman, has said, "The island is low, covered with cocoanut and other trees, and of greater extent than people who never saw it generally imagine. The north side forms a bay, across the mouth of which runs a reef of sunken rocks, which may be readily seen in the day-time, before you are near enough to run any kind of risk. It is totally impossible for any thing but small craft to anchor on this side, for there are no soundings close to the reef, and the deepest water over it is 6 feet, though there are 2 or 3 fathoms within it. The small vessels of the island go in here, as they do, likewise, on the south side, which is also foul, and not to be approached by strangers.

"The west end of Grand Cayman, which is best inhabited and mostly resorted to, is the only place where large vessels can come to; though even here it is but indifferent anchorage; for, without the utmost care you are in danger of getting your cables cut by the rocks; or may, perhaps, let go your anchor in a place where it cannot be pur-

chased. Our anchor got under the shelf of a rock, and we had two days' hard work to purchase it; nor could we have weighed it at all, if we had not borrowed a small anchor (we rode by our only anchor,) and backed with a swivel. This luckily hooked another shelf: we hove upon the cable that was fast to it, and then with much difficulty purchased our own anchor from under the rock. We came to in 11 fathoms, but most of the inhabitants say that 8 fathoms is the anchorage.

"Your first soundings going in are about 17 fathoms, three-quarters of a mile off shore; after which you shallow your water 2 or 3 fathoms, every ship's length, till you get into 8 fathoms, where you may come to in one of the white holes. These holes are patches of sand among the rocks, which you can easily see when looking over the side. Let a careful person look out forward, to pick a large hole, and be sure you let go your anchor well towards the weather side of it, that, when you veer away cable, it may not come upon the rocks. If it should come to blow, and you are in danger of dragging your anchor towards any of the shelves, you must heave it up again. You can plainly see your anchor as often as you please, and you can easily distinguish the rocky bottom from the white holes, by its blackness. Observing the above directions, you cannot get amiss; perhaps you will do best not to take a pilot, as they are not over careful.

"The west end forms a kind of double bay; the southernmost is the road. Give the middle point a good berth, as some rocks lie off it: you need not heave the lead until you see the bottom, for you will get no ground till then."

The Grand Cayman is inhabited by many persons, descended from the old buccaniers, exclusive of negroes. The climate and soil are singularly salubrious; the people are vigorous, and commonly live to a great age. They raise various produce for their own use, and have some to spare. As navigators, their chief employment is to fish for turtle, and to pilot vessels to the adjacent parts.

Refreshments may be obtained here; as fowls, turtle, yams, plantains, cocoa-nuts, &c., but no beef nor mutton. Water is procured by filling a bucket, about twenty yards from the beach; the well bearing N. N. E., or N. by E., from the anchoring place.

From the S. W. end of the Grand Cayman to Cape Corrientes, the true bearing and distance are N. 47° W., 74 leagues; and to Cape Antonio, N. 51° W., 84 leagues.

THE CAYMAN BRACK is very level land, covered with small trees, and at a short distance presents a smooth, unbroken surface, very like Navaza, except towards the S. W. point, where there is a small bunch of trees, a little higher than the rest, apparently logwood trees, as they are small leafed. The S. E. point appears very bluff, and the south side also very bold: we run down it at less than a mile distant, and saw no danger of any kind, except the breakers on the shore. From off the S. W. point, which is low and sandy, a reef runs off an eighth of a mile, but you can easily see the breakers, and even the colored water, a mile and a half distant. We were not far enough to the eastward to ascertain whether any reef extended from the east end or not; but, from the bold appearance of the S. E. point, I should think that if there are any reefs, they do not extend to the southward of the east point. The east end of the Cayman Brack is the highest, and with a slight but even declination towards the west end. The Cayman Brack is considerably higher than the Little Cayman, and before leaving the Cayman Brack you will rise the Little Cayman, of which you will not at first discern scarce any thing, except three large cocoa-nut trees on the east end; and which, at a distance, appear like two vessels at anchor. These cocoa-nut trees are the only ones I saw on this island. These islands are separated by a deep channel, and are resorted to by the turtlers.

PICKLE BANK.—On this bank there are from 14 to 17 fathoms water. It runs about W. by N. ½ N. It lies in lat. 20° 18′ N., long. 80° 23′ W. It was discovered by Lieut. Holland, in H. M. S. Pickle, in August, 1840.

THE ISLAND OF PORTO RICO.

This island is thirty leagues in length, and throughout this extent, from east to west, is a chain of mountains, with branches diverging to the north and south, and extending to the coasts. The whole are covered with wood, and in the intervals are fertile valleys and plains, watered by more than fifty rivulets, in the sands of which gold-dust has been found. The highest summits of the mountains are called the Peaks of Layoonita. They are often covered with snow, and may be seen from a great distance.

The capital, St. Juan, stands on the western part of an island on the north side, which forms a good harbor, defended by a citadel, called the Morro Castle, and other works. The town is populous and well built; the see of a bishop, and the residence of the governor.

The northern coast, which extends like the southern coast, nearly east and west, is but imperfectly known. It is rugged and uneven, having many rocks and islets, on

which the sea breaks heavily. Fifty miles north from Porto Rico, Captain Baxter, in brig Robert, struck on a rock, and remained several hours. The town of St. Juan, which stands at the distance of 9 leagues from Cape St. Juan, is the N. E. point of Porto Rico.

There are no large bays, either on the northern or southern coast, and a vessel may generally run along the former without any risk, at the distance of three miles, and along the south coast at five; fully observing, in the latter case, to give sufficient berth to the small isle, called Dead Chest, which lies about half way between the S. E. and S. W. points of Porto Rico.

The harbor of St. Juan* is very capacious, and the largest ships may lie there with the utmost safety, in 5, 6, and 7 fathoms. The entrance is along the island on which the town is erected, and between the Morro Point and three islets, called the Cabras, or Goat Islands. South of the latter is a small islet, occupied by a little square fort, or castle, called the Canuelo, which defends the western side of the harbor. The channel is generally buoyed.

The western and southern sides of the harbor are flat and shoal. The western side of the entrance is rocky, but in the channel the ground is generally of gravel and sand, with a depth of 5, 6, 7, and 8 fathoms. From the south side of the town, a low point of land extends to the southward, and is surrounded by a shoal. Ships generally ride to the eastward of this flat, and out of the wash of the sea, occasioned by the trade wind, which commonly sets directly into the harbor.

If you make the harbor with the wind southerly, you must run into the channel with all the upper sails well set, in order to preserve your way, when you come under the lee of the Morro, and have a boat out for towing, or to carry out a warp, both of which are frequently necessary. It is high water in the harbor at 8h. 21m., on the full and change; and the greatest rise is about one foot and a half.

Off the eastern coast of Porto Rico, are numerous keys and rocks, which cannot be approached by large vessels, and therefore serve as a rendezvous for smugglers, &c. Before these are the Isles Culebra and Vieque, or Snake and Crab Islands. The passages among these isles and rocks are generally deep; but no one may venture in who is not intimately acquainted with the place.

Passage between St. Thomas's Island and Calebra and Crab Islands.

In this channel there are soundings, with 20 fathoms on the west side of it; and, approaching either the island of Culebra or Vieque, it is shoaler. We had 10 fathoms, with the following bearings:—East end of Crab Island, S. by W. ¼ W.; east end of Culebrita, N. by W. ¾ W.; and Sail Rock, E. by N. ¼ N. The currents set through this channel strong to the westward, which would render it necessary, in case of being becalmed, to anchor before you are drifted on the western shore.

VIEQUE, OR CRAB ISLAND.—It is of moderate height, and well wooded. The S. W. end is hilly, and to the westward it is low and uneven. On the west end is a low and sandy point; and, with it bearing N. by E., about one mile and a half, is the anchorage. In working in, do not bring this point to the southward of east, as there are numerous shoals between it and the east side of Porto Rico. We found the soundings regular, and 1½ mile from shore you will have 6 fathoms. The shore should not be approached nearer, as the soundings there are irregular, and the ground rocky. There are a few settlers, principally on the north end. There are two sandy bays on the west side: the northernmost is bold and the bottom of sand. You may approach it to within three-fourths of a mile, with 4 fathoms. The southern one has a rocky bottom, soundings irregular.

CARLIT, OR SERPENT'S ISLAND, sometimes called the Great Passage Island, is more than six miles in length. It has numerous reefs and keys about it, which require a large berth when passing. Off its eastern side is Culebrita, or Little Passage Island, from the south end of which a dangerous reef extends to the S. S. W. and S. W., three miles. To the west of the southern part of this reef is the harbor of Culebra, which is two miles in extent from the entrance. There are two channels into this harbor, which are divided by a bed of rocks, and bordered with reefs, but the interior is clear and secure. Great caution is required when entering; but a pilot lives in the port. Plenty of wood, water and fish, may be obtained. The neighboring keys are famous for the great number of tropical birds which breed here.

The course through the Virgin's Passage, on the east of Vieque and Calrit, is N. W. by N., or rather N. N. W., in case of a calm and lee current; the western side being foul, and without wind, it is dangerous. Continue on this course until Cape St. Juan, the N. E. point of Porto Rico, bears W. by S. or W. S. W., and you will be clear of all danger.

If you are bound down the south side of Porto Rico, observe you will see the S. E.

*See Plan published by E. & G. W. Blunt, 1833.

point of that island when lying at anchor at Crab Island; it bears from thence, S. W. by W. ½ W., or W. S. W., about 4½ leagues, and is called Pasqua, or S. E. Cape. You may run down till you come abreast of that cape, within three or four miles of it; and then steer west; and by the time you have run three leagues down past the cape, and it bears N. E., you will see a large breach, or shoal, two or three miles in length, which lies three or four miles from the coast. By keeping a mile or two without the breach, in running down, you will descry a small building by the water side, which is a guard-house; and by running down as directed until the guard-house bears N., or a little to the weathermost of that bearing, you may haul in N., or N. by E., for it, and anchor in 4 fathoms, with the house bearing N., or N. by E., one mile distant, and the west end of the breach S. by E. This place is called * Guayamo, or Yamma Bay, and is much frequented, though there is no other shelter from the effects of sea-breezes than the reef. In going in, although you give the west end of the reef a good berth, you must keep the lead going; the soundings are irregular, from 5 to 7 or 8 fathoms, whence it shoalens gradually in shore. The land by the water side is low, but up in the country, high and uneven, as before explained. In going out of Guayamo Bay, run S. S. W., or S. W.

From Guayamo Bay the next trading place is Salinas, a good place to lie in. The Caxa de Muertos, or Dead Chest, may be seen from, and is a guide to it. When at the distance of from two to three leagues from Guayamo Bay, you may steer W. ¼ S., passing several keys to the northward, which lie near the shore; then, having run to a sufficient distance, haul in for the western end of the outermost of these keys, and about a mile or a mile and a half off that end is a reef, or sunken key, which cannot be seen, but the sea breaks over it; leave this to the westward, and run with the westernmost key on board, within a cable's length. This key is bold to, but shoaler to leeward, towards the breach. The guard-house is three or four miles from this key, and may be seen before you get within. You may run in boldly for two miles towards the guard-house, and anchor within a mile of the same, in four or five fathoms, good ground, and moor to the north-west.

When at anchor at Salinas, with the guard-house bearing N. ½ E., there is a good watering place close to the water side, a kind of lagoon, which will be about N. by W. from the ship, and half a mile to westward of the guard-house. The water appears white to nearly a league without the key. The soundings are from 12 to 7 fathoms, very gradual, and there is no danger.

Within the key above mentioned, there are several other keys a little to the eastward of it; and in running in you will see, at about three leagues to westward, two small keys at a little distance from each other, one appearing double, the other single; you leave them to windward.

In quitting Salinas, steer outward in the same way as you entered. When without the key steer S. S. W., until the Dead Chest bears west; you may then run down boldly, giving that isle the berth of a mile. There is a small key about a cable's length from the S. W. end of the Dead Chest, to which a berth of a mile and a half should be given. You may then haul in, and anchor under the lee of the isle, at pleasure, in from 7 to 12 fathoms. With the west point of the small key S. by E. ½ E., one mile and a half distant, and the north end of the Dead Chest N. E. ½ E., there are 10 fathoms of water, at a mile from shore.

CAXA DE MUERTOS, OR DEAD MAN'S CHEST.—This island is on the south side of Porto Rico, and bears E. ½ S., 36 miles from Cape Roxo. When made, it appears in form of a wedge. The north end is high, the centre low, and the south end has a sugar-loaf mountain, which at a distance appears a detached island. The anchorage is on the west side, off the low land, half a mile off shore, in 8 fathoms, in the following bearings:—South-east point of the small island, connected to Caxa by a reef above water, S. W.; the only sandy bay S. by E.; the north-west point and northern peak in one, east. There is no danger on the west side of this island, and off the low land the soundings are regular; but to the northward of it the water is deeper, and you will have 17 fathoms close to the shore. Off the southward of the island there is a shoal, which breaks about half a mile off shore.

PONCE.—The town and harbor of Ponce lie about 4 leagues to the east of Guanico. To run for this port keep a mile off the small key off the S. W. end of the Dead Man's Chest, and run N. W. ½ N., or N. W. by N. The land is low near the water, covered with mangrove bushes and some cocoa-nut trees; but the houses are also low, so that you will not see them until you open the harbor. In running over, you will see a low sandy island, which you leave on the larboard hand. If it blows fresh, the reef which you turn round on the starboard hand, will appear as though there were breakers across the mouth of the harbor; but, as you approach, you will find the breakers do not make off far from the bushes. You may pass them within two cables' length, and keep nearest the shore on the southern side of the harbor.

* Guayamo may be known by a windmill on a hill, one mile to the westward of the anchorage.

In proceeding on a west course towards Cape Roxo, that cape, when first seen, appears low, grey, and like two keys. A shoal, called the * White Grounds, encompasses the cape, and extends to the S. W. At 2 or 3 leagues to the eastward and westward of this cape, there are 10, 12, and 15 fathoms. It is a coral bank, and close to the outer edge no bottom is to be found. The southern extremity bears from the cape S. W. ½ W., 8 or 9 miles.

The schooner Dick, Capt. Miles, of and for Baltimore, from La Guayra, with a cargo of coffee, struck on the Morillos Rocks, south side of Porto Rico, at midnight, on the 13th of June, and was totally lost.

Nearly half way between the Caxa de Muertos and Cape Roxo, is the small but secure harbor of Guanico, which is described hereafter. Four leagues more to the east, is the village and road of Ponce.

To enter Mayaguez, (Porto Rico,) bring the Island of Zacheo to bear W. N. W., and steer E. S. E. You may approach the island within 50 fathoms. There is a reef which begins about 1½ mile from Zacheo, and extends to Cape Roxo, forming a chain with only 10 feet water, and not to be attempted but by small vessels. In steering E. S. E. you will perceive a gully running from the mountain, made by frequent rains, without a tree or bush on it.

To anchor in Mayaguez Bay, bring the Island of Zacheo to bear W. N. W., then steer E. S. E., which will bring you in sight of the town. Going in you will see a reef on your starboard hand; when abreast, you will have soundings in 13, 12, and 10 fathoms; you may run into 7 fathoms and anchor; the extreme points of the bay will bear from S. by W. to N. W.; the east part of the reef about N. W., 2½ miles. There is a good river for watering.

Extract from the Journal of an experienced Navigator, along the South side of Porto Rico, and in the Channel between Porto Rico and St. Domingo, &c.

"May 19th, at 5 o'clock, P. M., we thought we descried to N. W. and N. W. by N., the little Island of Boriquem, (Crab Island,) situated near the S. E. end of Porto Rico. At 11 we saw the land on the larboard hand: I supposed it to be the east point of Porto Rico, which bore from us N. W. and N. W. by N., distant about 3 leagues. I steered west to run along its south side.

"May 20th.—At half past 5 A. M., we saw Porto Rico, and the Dead Chest, which is a small island detached from the main one, and having the form of a coffin. It lies very near the middle of the south coast, and I have been assured that there is a passage for the largest ships between it and the main land.

"I ran along the land, with an offing of 3 or 4 leagues, to fetch Cape Roxo, the westernmost of the south coast of Porto Rico, and which forms, with the S. E. point of St. Domingo and Saona Island, a channel from 15 to 20 leagues broad.

"About 10 A. M., we saw the water discolored: we were upon a shoal, called the White Grounds, which encompasses Cape Roxo, and extends 3 or 4 leagues to the S. W., and 2 or 3 leagues to the eastward and westward of this cape. You have there 10, 12, and 15 fathoms. The sand at the bottom is of such a shining white that it pierces through the water. We caught plenty of fish with the line.

"At 11 we distinguished a cape, which lies a little to the eastward of Cape Roxo. It is terminated to the south by four little islands, which seem to be one league distant from it. To the east of this cape is a small bay, called, in Van Keulen's chart, by the name of Porto Guanico. The West India sloops can moor there: we saw two of them at anchor. This cape is low, and appeared at first as a detached land, but we soon discovered the low land by which it is connected with the main island. Cape Roxo, which you soon descry to the westward of this, and which is the westernmost point of the island, is still lower than the former. Between the two, you distinguish a flat and very white sandy shore: it consists of the same sand that composes the White Grounds, through which you may sail, but you must not come nearer the coast than two leagues.

"In the western part of the channel, between Porto Rico and St. Domingo, and near mid-channel, are two small islands; the easternmost, which is likewise the southernmost, is called Mona: the second to the N. W. of the former, distance about 2½ leagues, is called Monica. You must pass, if possible, to the windward, that is to the eastward of those two islands, in order to double with more facility Cape Enganno, that forms the going out of the channel, to the west on the side of St. Domingo. When you have doubled Cape Roxo, you descry to the northward of Zacheo, a little island lying 8 or 9 leagues to the N. E. by N. of Mona. You leave Zacheo to windward, to pass between it and the small Island of Mona, very near mid-channel: there is no danger but what you can see. When the wind comes from the E. S. E., or only from the east, you are not obliged to tack, you cross the channel with a quarter wind. It is sufficient to steer N.

* The tracks and soundings on this shoal are those of the U. S. frigate Congress, Charles Morris, commander, and may be depended on.

W. by N. to fetch Cape Raphael, which is the N. E. point of St. Domingo, or even Cape Samana, that lies about 8 leagues to the N. W. of the former. Samana Island, whence this cape takes its name, extends from east to west, 12 leagues: it is so near St. Domingo that it appears to be joined with it.

"At noon Cape Roxo bore N. by W., distant 3½ leagues. It was not possible, on account of the cloudy weather, to take the meridian altitude of the sun. We steered N. W. by N. to enter the channel.

"At half an hour after 12, I could see Zacheo very plainly: I continued the same course to run along it, at one or two leagues distance. This island appears to be 800 or 1000 yards long; it is nothing more than a green mountain, on several parts of which you see some woods. I was too much to windward to see the Islands of Mona and Monica from the deck, but they could be perceived from the mast head. The wind kept to the S. E. till 4 o'clock. It is very seldom that in sailing through the channel of Porto Rico, you go before the wind, as I did."

Description of Porto Rico, from the "Derrotero de las Antillas, &c."

"This island is 31 leagues in length from east to west, and 11 leagues in breadth in the broadest part. The N. E. point of it is named Juan, (St. John's head,) where the range of mountains, called Luquillos, commences. The highest part of these, El Yunque, or the Anvil, may be seen at the distance of 68 miles. The range continues to the westward with many intervals or openings, until it ends at the hill named Silla de Caballa, (Horse's Saddle,) which is to the southward of Arrecibo.

The harbor of San Juan requires a pilot. The harbor of Arrecibo is about 9½ leagues more to the west; it has a small town on its western side, and a good river, but is little frequented, being open to the north winds. From Arrecibo the coast trends nearly true west to the N. W. end of the island. The land here is generally low, until it reaches Punta de Pena Agujereada, (or Point of the Holed Rock,) where a kind of cliffy high land begins, which trends S. W., rather more than a mile, to Point Bruguen, the northwesternmost point of Porto Rico. The coast again declines in height, and forms a convex bow, to Punta de Penas Blancas, (Whitestone's Point,) the north point of Aguada Bay.

AGUADILLA BAY.*—From the Point Penas Blancas, the little town of Aguada bears S. S. E., 2 miles. In the bay before the town, or rather village, is anchorage for the largest ships, with shelter from the sea breeze. This bay may be entered at any hour of the day, with facility and safety; but not at night, as the breeze then dies away, and a calm ensues. There is excellent water to be obtained at a rivulet which passes through the middle of the village. The situation of the latter, as given by the Spanish officers, is lat. 18° 25′ 53″, long. 67° 0′ 20″.

This bay is much frequented by vessels bound from Europe to Cuba, both on account of the facility with which they can procure refreshments, and because pilots for the Bahama, or Old Channel, may always be found here. If intending to anchor in Aguada Bay, after rounding Point Bruguen, keep about three cables' length from the shore, in order to give berth to a shoal which spits out from Punta de las Palmas; whence to that of Penas Blancas, you may approach the coast nearer, as it is very clean; and at half a cable's length from the shore you may find four fathoms of water.

To anchor, bring Point Aguada N. N. W., 2 or 3 miles, the church tower E. N. E., the Island of Zacheo W. by S., when you will be in 10 fathoms water, about three cables' length from the shore; there is a good river of fresh water; the sea in general smooth, with usual trade wind; but should the wind incline to the northward, avoid anchoring, or weigh as soon as it sets in.

At S. W. by W., 7½ miles from the village of Aguada, is Point St. Francisco, with various rocks about it. All the coast between has a beach, with many shoals, formed by the rivers that empty themselves into the sea. At two cables' length from the coast are 4 fathoms of water, with bottom of rocks and sand; but there is no anchorage. At S. W. by S., rather less than half a mile from Point St. Francisco is Point Guigero, the westernmost Point of Porto Rico, otherwise called El Rincon. About it the ground is shoal, with many rocks.

Remarks on Aguadilla Bay, &c., by Capt. John Mackellar, R. N.

"The town is in lat. 18° 24′ 57″, and long. 67° 8′ 15″. In proceeding for the anchorage from the northward, you may run round the N. W. point of the island, about S. W., or S. S. W., within a mile of the shore; your depth of water will be 20 or 25 fathoms. Point Bruquen, the N. W. point, is a high steep cliff; about a mile to the southward of it is Point Palmas, a low sandy point, covered with trees. The latter forms the north side of the bay; and, in rounding, you must give it a berth of a mile, as a reef stretches off at that distance. Having rounded this reef, with the bay fairly open, you will see

* Called Aguada on some charts.

the town, lying on the N. E. side of the bay, with straggling houses to the S. W., for two miles. The anchorage is before the town and near the shore. The whole of the bay is perfectly clear, with the exception of the white reef, (Penas Blancas,) extending from Point Palmas; and you may stand to a quarter of a mile from shore any where, for the depth of water will not be less than 7 or 8 fathoms. The marks for anchoring are, a large house standing by itself, about a cable's length from the north end of the town. Between it and the town is a small battery of three guns. Bring this house to bear N. E. ½ N., the church steeple E. ½ S., and the north point of the bay N. by W. Here you will have 18 fathoms, and very good bottom, at about half a mile from shore. The anchorage is very good farther in shore, in from 10 to 15 fathoms. If you moor, lay your anchor in 10 fathoms, and outer one in from 15 to 18. There is also good anchorage in from 20 to 24 fathoms, but there you are more liable to drive off the bank. In shore the anchorage is so extensive, that you can hardly err in anchoring any way before the town. The winds are frequently variable, and render it difficult to get up to the anchorage. At times the sea breeze blows fresh over the land from the N. E.; then you may beat in with ease.

In the winter months, when the north wind blows strongly, there is a heavy swell into the bay, and great surf on the beach. Large ships ought not then to anchor farther in than from 23 to 25 fathoms; they will thus have room to get under way and work out, in event of its coming on to blow; and, as the west point of the bay bears from the anchorage S. W. ½ W., a ship will lay out with the wind at N. W., and may run through between Zacheo and the S. W. point of the island.

"Ships coming from the southward for Aguada, may also pass between Zacheo and the island; and when Zacheo bears W. by S. they will have the bay fairly open, and may work up as above; taking care to keep the west point of the island bearing to the southward of east; for, off it, there is foul ground all the way to the southward, as far as Cape Roxo, but all clear to the northward.

"From Point Guiguera, (says the Derrotero,) the coast trends S. E. by S., three and a half miles, to Punta de la Cadena, having one small bay, named Del Rincon, which, although well sheltered from the sea breeze, has a very unequal bottom, and is full of rocks. After Punta de la Cadena follows that of Algarroba, which lies S. E. ½ S. from the former. Between these points lies the Bay of Anasco, fit for vessels of any size, in which they will be completely sheltered from the norths, or north winds. The coast is all beach, and the bank, or shallow water, which extends from it about half a mile, is probably formed by the River Anasco, which disembogues at this place.

"The Punta de Algarroba is the north point of the Bay of Mayaguez, and lies nearly N. by E and S. by W. with the south point, named Punta de Guanagivo: the distance between them being about four miles.

"The anchorage of Mayaguez is well sheltered from the Norths, and fit for brigs and ships, provided they are not very large; but a good knowledge of its entrance is necessary, in order to avoid a shoal, which stretches out about half a mile from Punta del Algarroba. It is necessary, also, to give a berth to the Puntilla, or Little Point, for a reef stretches out about two cables' length from it.

"To the westward of Punta del Algarroba, and about a large mile from the coast, there is a rocky shoal, named Las Manchas, with 4 fathoms of water on it; but vessels may pass very well between it and the shore.

"A little without the line of the two points, and about half way between them, is a rocky shoal, stretching nearly N. and S. Its length is about half a mile, and its greatest breadth not much less; it is named Baxo de Rodriguez, (Rodrigo's Shoal.)

"To anchor in the part of the bay which is best sheltered, having rounded the Little Point, (Puntilla,) place yourself in such a situation that, when the Island Desecheo is directly astern, you will have the highway of the town of San German exactly ahead. St. German is upon a hill, which is pretty high and pointed. The highway is of red earth, and winding like a snake; and there can be no danger of mistaking it, as there is no other. Run thus until being something to the southward of the Little Point, you may luff up and anchor within it, in either 3 or 4 fathoms, as you may think proper. The River of Mayaguez runs into the sea at the bottom of this bay; and in it, the schooners and sloops for the most part winter, as it is the best anchorage on the west coast of the island.*

* The following is a former description of the Bight of Mayaguez: On the western side of Porto Rico is the Aguada Nueva, one of the finest roadsteads for shipping in the West Indies, being sheltered from the trade winds by the island. Here the galleons and flota generally anchored and obtained refreshments when they came from Spain. Ships may anchor in the road, in from 23 to 8 fathoms, good ground. In 23 fathoms, soft oozy ground; the northernmost point bears N. N. W., 3 miles; the other point S. by E., about two leagues; and a small village, among the trees, is distant about one mile. In coming into this road from the northward, you may sail within a mile of the shore to the southward of the north point, there being 10, 12, and 15 fathoms of water; and, having passed that point, you will have 25 and 30 fathoms, soft oozy ground. Some part along the ground is flat and rocky, but you may sail all round within half a mile of the shore.

"South from Punta de Guanagivo, about 5½ miles, is Puerto Real de Cabo Roxo; its figure is almost circular, and the extent from west to east is about three-quarters of a mile. At its entrance are 3 fathoms of water, and in its middle 16 feet. The entrance is by a very narrow channel, near the south point of the harbor, and from the north point a great reef stretches out, which, doubling Cayo Fauduco, ends at Puxta de Varas.

"S. S. W. from this, at the distance of 2 miles, is the Punta de Guaniguilla, which is the north point of a bay named Del Boqueron; this is so full of reefs as not to allow anchorage. Punta de Melones, (Melon Point,) which is the south point of the bay, is distant from the first (Guaniguilla) about two and a half miles, or a little more; and nearly west from this point, at about six and a half miles distant, is the Baxo de Gallardo, (Gilliard's Shoal,) of which we shall speak hereafter. Along the whole of the west coast the Monte (or Hill) de la Atalaya may be seen. It is the highest and most northerly peak of the two, which are seen on the highest part of the mountain range, and which stands S. E. by E., true, from the Punta de San Francisco, and which does not alter the appearance of its shape, even when you are to the southward of the Isle Desecheo."

SHOALS OFF THE WEST COAST.—Besides the shoals on this coast already noticed, there are several others, which we shall now describe.

"1st. That denominated Baxo Negro, (Black Shoal,) which is a reef of very small extent, and upon which the sea always breaks. It is distant from the nearest coast about 3½ miles, and lies W. S. W. ½ W. from Punta Guanagivo, and S. ¾ E. from Punta de Guiguera.

"2d. That called Media Luna, (Half Moon,) which is a reef of about two-thirds of a mile in length, north and south, and about two and a half cables' length. The sea always breaks upon it; it is about 5 miles from the coast; half a mile from it, about E. N. E., there are three rocks which show above water, and on which the sea always breaks. The northern extremity of the reef is nearly S. W. by W. from Punta de Guanagivo, and south from Punta de Guiguera.

"3d. That named Las Coronas, (the Crowns,) which are shoals of sand, on which at times the sea breaks, and the extent of which, in all directions, is scarcely a mile. It is about three and a half miles distant from the coast, and bears nearly S. W. by S. from Punta de Guanagivo, and S. ½ E. from Punta de Guiguera.

"4th. A shoal which lies to the westward from Punta de Guaniguilla, at the distance of two miles. It may be about two cables' length in extent, and there are three fathoms of water upon it: the bottom is rocky. It bears S. by W. ¾ W. from the Punta de Guanagivo, and S. ¾ E. from Punta de Guiguera.

"5th. Baxo de Gallardo, which is almost due west from Punta de Melones, and six miles and a half distant from it. Its extent is about three cables' length, and the least depth of water on it is 3 fathoms, with rocky bottom. It lies with the Isle Desecheo bearing N. by W. ¾ W., Monte de Atalaya S. by W. ¾ W., and the southern extremity of the Morillos E. S. E."

The South Coast, from West to East.

From the Morillos, or Little Hills, in the S. W., to Cape Malapasqua, which is the S. E. extremity of the island, the coast is of double land, and is very foul, with reefs, islets and shoals, which stretch out from it. In the middle of it is the island Caxa de Muertos, or Coffin Island, distant from the coast 4 miles, and foul on both its N. E. and on its S. W. sides.

GUANICO.—On this coast the best anchorage is in the harbor of Guanico, 5 leagues to the eastward of the Morillos: it is fit for vessels of all classes, with from 6½ to 3 fathoms of water, which latter depth is found in its interior. The bottom is of sand and gravel. The mouth of the harbor is in the middle of a bay, formed by the point and cliff of Brea (Pitch Point) on the west, and that of Picua on the east. In the neighborhood of this last are two islets, and from them to Punta de la Meseta, which is the east point of the entrance of the harbor, there is a reef, which reaches out from the coast about a mile, and nearly forms a circle, uniting at one end with the islets, and at the other with Punta de la Meseta.

Between Punta de Brea and Punta de los Pescadores, (Fisherman's Point,) which last is the west point of the mouth of the port, the coast forms another bay, of which the mouth is shut by a reef that, running out from Punta de Pescadores, ends on the south side of the bay, about a mile within the point and cliff of Brea. It is necessary not only to give a berth to the reef which runs from Punta de Picua to Punta de la Meseta, but also to a rocky shoal, which stretches out a short half mile from it.

To enter this harbor you must steer on the outside of these banks or reefs. To do this, bring the Punta de la Meseta exactly in one with one of the Paps of Cerro Gordo, which are at some distance inland. If you run in with the point in one with the western Pap, you will have the bank very close, but will have 10 fathoms of water: but if you run in with Punta de la Meseta in one with the eastern Pap, you will pass without any

risk whatever. You will have passed the shoal when the islets at Punta Picua bear E. ¼ N., or perhaps a little sooner.

If you advance to the harbor by Punta de Brea, or Pitch Point, you may pass this point or bluff at a cable's length, and thence steer to within the Punta de la Meseta, passing it, if necessary, at a quarter of a cable's length, and thence proceeding for the interior of the harbor, only observing that you may make bolder with the south than with the north side of the entrance. You may anchor where you please, in 4 or 5 fathoms of water.

Directions for making Porto Rico, &c.

By those advancing from the eastward, and bound for Porto Rico, every precaution must be taken, so as to avoid the dangers of Anegada. This island, the last of the Virgins to the N. E., is so low, that it may be considered rather as a dangerous shoal, than as an island. If navigating with care, and with certainty of the situation of the vessel, nothing is easier than to cross the meridian of Anegada on a parallel above 19°, and so to run down afterwards on Porto Rico, as to make the land to windward of your destined port: thus you will not be obliged to beat up again for a distance overrun, at the expense of both time and labor. But as it may happen, among the multitude of those who navigate, that some one may be misled by an erroneous reckoning, and find himself in this predicament, we recommend it to such, in order that they may avoid the dangers of Anegada, and also avoid overrunning Porto Rico, that they, at all times, shape a course to make the Islands of St. Bartholomew and St. Martins, (or the parallel of 18°,) because these islands are high and clean, and there is no danger of being wrecked on them, although sailing by night, or in thick weather, so that you have a league of horizon; for that distance here affords time, either to steer so as to take some of the channels, or, in case you prefer it, to haul by the wind, and wait for day-light, or for clear weather. Neither is there a risk of passing them without seeing them; and even if by a combination of circumstances, which will be very strange, this should happen, they could not fail on the following day to see some of the Virgin Islands, by which the situation of the vessel might be rectified. In choosing either of the channels between St. Bartholomew and St. Martin's, or between the latter and Anguilla, we should prefer the latter, because it has no detached islets lying off from the principal lands; and, therefore, running through it, even at night, it is not so unsafe. Having run through any of these channels, the course must be made to the south of the Virgins, and thence to the N. W., so as to make the Cape of St. Juan of Porto Rico, and having recognized this, you have only to run afterwards as may best answer for your port of destination.

From the Island of Porto Rico you may escape from the region of the general or trade winds, into that of the variables, merely by steering to the north; and as this island is so far to windward, it is easy to gain all the easting that is necessary for going to the lesser Antilles, or Caribbee Islands. You may gain thus to windward, and beating with the breeze without being under the necessity of running into high latitudes to catch the variables. On Porto Rico you cannot count on land breezes to facilitate the getting to windward, for on the next coast, the utmost is that the breeze calms at night, but no land breeze proceeds. Lastly, from this island, you may, on one stretch, catch any point of the Colombian Main, from Laguayra to leeward.

General Directions for the making of, and navigating among, the Caribbee Islands.

[From the Derrotero de las Antillas.]

As to choosing the north or south part of any of these isles for making your land-fall, you ought to consider, firstly, which point is nearest to the port or road to which you are destined; and, secondly, the season in which you go. In the dry season, it is to be remembered that the winds are generally from the north-eastward, and in the rainy season they are often from the south-eastward. Thus, in the dry season, it is best to make the north side, and the wet season, the south, but without losing sight of the first consideration.

There can be no mistake in recognizing any of the Antillas; and, in making St. Bartholomew's and St. Martin's alone, can there be any doubt on seeing at once the eminences or heights of various islands. That this may not mislead any one, they must remember the following instructions.

When in the parallel of St. Bartholomew's at less than four leagues off, if there be no fog or haze, the islands of St. Eustatius, Saba, St. Kitt's, Nevis, and St. Martin's appear plainly.

The mountain of St. Eustatius forms a kind of table, with uniform declivities to the east and west. The top is level, and at the east part of this plain a peak rises, which makes it very remarkable. To the west of the mountain seems to be a great strait, (in consequence of the lands near it being under the horizon, or seeming drowned,) and to the west of that there then appears, as it were, another long low island, the N. W. part

of which is highest; but it is necessary not to be deceived, for all that land is part of the land of St. Eustatius. From this station Saba appears to the N. W.; it is not so high as St. Eustatius, and apparently of less extent than the western part of St. Eustatius, which is seen insulated.

The N. W. part of St. Kitt's is also seen, formed by great mountains, in appearance as elevated as St. Eustatius, with low land to the east: to the eastward of this low land, Nevis will be seen, apparently higher than all the others.

The lands of St. Martin's are notably higher than those of St. Bartholomew's; and this island appears also when you are some leagues farther distant from it than from St. Bartholomew's.

When there are any clouds which hinder St. Martin's from being seen, there may be some hesitation in recognising St. Bartholomew's; and thus it is proper to notice that the latter, seen upon its own parallel, appears small, and with four peaks, trending north and south, and occupying almost its whole extent; and if you are not more than 8 leagues from it, you will see, also, the appearance of an islet to the north, and another to the south, at a very short distance. As this island has neither trees, high mountains, nor thickets, it is not subject to fogs; and it may therefore be seen oftener than St. Martin's, St. Kitt's, Nevis, St. Eustatius, and Saba; it is therefore advisable to keep its appearance in mind.

At 8 leagues to the east of St. Bartholomew's you may see Nevis very high; from it to the west the strait called the Narrows, and then the lands of St. Kitt's, appearing to rise out of the water, and which continue increasing in height to the westward, so that the westernmost of two mountains, which are at the west part of it, is the highest. This mountain, which is higher than that called Mount Misery, has to the west of it a gentle declivity, terminating in low land; and it cannot be mistaken for any other. To the west of this you may also see the large strait towards St. Eustatius; but from this situation you will see only the high S. E. part of that island, or rather its mountain, in consequence of which it appears like a very small island, while its mountain seems to be lower than Mount Misery; but it is easily known from the table which its top forms, by the uniform declivities to the east and west, and by the peak on the S. E. part of it. Saba seems, from this situation, equal in size to the visible part of St. Eustatius; but it shows only an eminence without peaks, with uniform declivities, and almost round.

If a small islet appears to the west of, and very near to St. Eustatius, that must not confuse you; for it is the N. W. extremity of that island; and on getting nearer, you will perceive the land which connects it with the S. E. part. Mount Misery, on St. Kitt's, which has a very high and sharp peak on the eastern part of its summit, seems at a distance to be the summit of Mount Eustatius; but it cannot be mistaken for such, if you attend to its surface, being more unequal than the table land at the top of St. Eustatius, and that there is another less elevated mountain to the east, and with gentle declivities, which show much land to the east and west of the high peak.

On no part of Mount Misery can any resemblance be traced to a man carrying another on his back, and which, according to a saying, was the reason why Columbo named this island St. Kitt's.

When you are 6 leagues to the east of St. Bartholomew's, its N. W. extremity appears insulated, and has the appearance of a pretty large island, on the top of which there are four small steps, (like steps of stairs, Escalones,) with a considerable strait to the south, between it and the principal island. In the middle of this strait you may also see a smaller islet. This is really one of the islets which surround the island; but the first is only the N. W. point, to the north of which you will also see some islets: all these are much nearer St. Bartholomew's than St. Martin's.

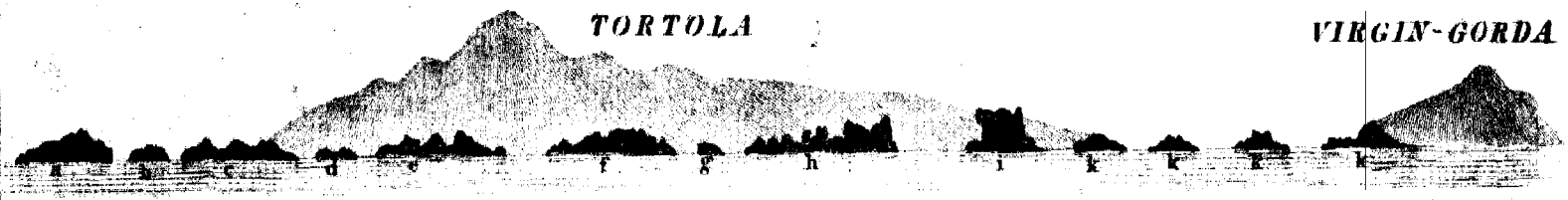
Finally, to navigate from one of the Antillas to another of them, there is no more trouble than what a simple navigation requires; but it is something greater when you have to get from leeward to windward; yet this will be reduced to a trifling consideration, if the navigation is made by the straits which are to the north of Martinique, and in which the currents are weakest; but the same does not follow in the southerly straits, in which the waters set with more vivacity towards the west; and it would be impracticable by the straits of Tobago, Grenada, and St. Vincent, in which the waters run at the rate of not less than two miles an hour.

WINDWARD AND LEEWARD ISLANDS.

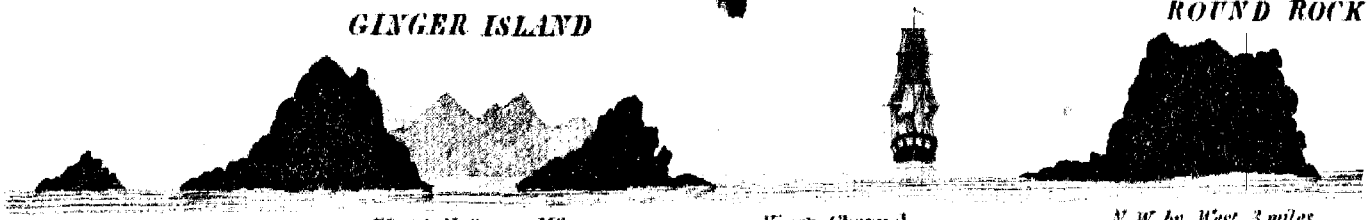
Under the denomination of Windward Islands, we include the whole range from the Virgins to Trinidad; and under that of Leeward Islands, the range which exist between Trinidad and the Gulf of Maracaybo.

Engraved for the American Coast Pilot 14th Ed.

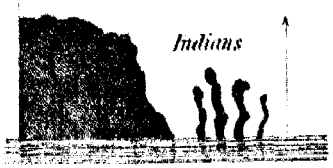
VIRGIN ISLANDS.



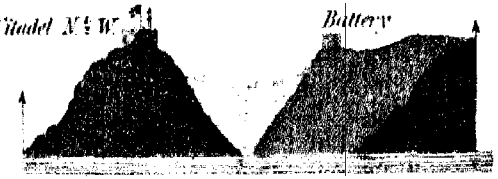
The Range of Islands and Rocks to the Eastward and South Eastward of Tortola, when the East of Normands Island (a) bears West 3 or 4 leagues distant.



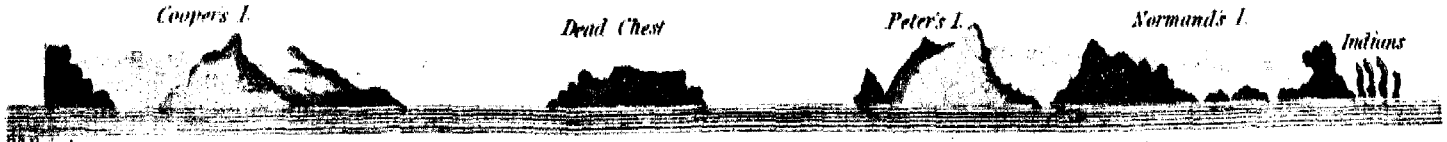
Entrance of Tortola Road bearing nearly West



The Indians, &c. as they appear on approaching Road Harbour Tortola



Entrance of Road Harbour on approaching from the Eastward.



Islands and Keys to the Southward of Tortola as they appear from Tortola Road

REFERENCES.- a, Normands I. East end: b, Rocks: c, Peters I. W. by N. ½ N: d, Dead chest, W.N.W. e, Salt Island, N. W. ½ W: f, Coopers Island g, The Carvel: h, Ginger Island: i, Round Rock: k k k k, Broken City, or Old Jerusalem.

New York, Published by Edmund & Geo. W. Blunt, 170 Water Street 1831

W. Hooker, Engraver, 151 Water Street N. York.

The Windward Islands appear at a distance as if united together: but there are many deep channels between them, through which those acquainted sail with safety.

The Passage Isles, which are dependencies of Porto Rico, and the Isles of St. Croix, or Santa Cruz, which lie to the southward, were originally included under the general name of the Virgin Islands.

The western division (Danish) includes the Islands of St. Thomas and St. John, with the numerous islets, as those of St. James, Montalvan, or Little Saba, Savanna or Green Island, the Brass Isles, Hanseatic, and others. The eastern division (British) includes Tortola, Virgin Gorda, Anegada, Jost Van Dyke's Isles, the Thatch Isles, Normand's, Peter's, Salt, Cooper's, Ginger, Beef, Camanoa, Scrub, and Guana Isles, with a number of islets in their vicinity. The whole group, Anegada excepted, is high, craggy, and mostly bold to.

Tortola, a few miles to the N. E. of St. John, is the principal of the English Virgin Islands. It is near 5 leagues long, and 2 broad, but badly watered, and has the name of being unhealthy. The entrance is wide, with plenty of water.

The town is situated on the south side, at the bottom of a bay 2 miles deep, with a pretty good road at the entrance, with 12 fathoms water, good ground.

Virgin Gorda, that is, the Great Virgin, or Penniston, more commonly Spanishtown Island, lying to the eastward of Tortola, is formed of elevated land, and is watered even worse than Tortola. The Island has two good harbors, the largest of which is that called East Bay, on the northern side, wherein you may anchor very safely in from 5 to 10 or 12 fathoms, to leeward of the island called the Prickly Pear; but the entrance is narrow, being obstructed by a reef on each side. The next harbor is that called the Great or West Bay, which is in some degree sheltered to the west by the islets called the Dogs. The roadstead here has very good holding ground, of sand and ooze, in 8 to 10 fathoms of water. In the smaller bay, called Thomas Bay, more to the S. W., vessels may anchor before the town, in 6 or 8 fathoms: but there is a reef in the middle of the bay, which stretches north and south; and there are likewise many rocks in the bottom, which chafe the cables.

The course from Saba to Virgin Gorda is N. W. by W. northerly, above 26 leagues. When Virgin Gorda bears from you N. W. by N., 7 leagues off, the Virgins appear like three islands, with a great many small ones about them; the middlemost is the longest, and when you come within 3 leagues, they seem as if they were joined together.

The best mark for Virgin Gorda is an insulated hill, of moderate height, standing near the middle of it, and which is easily known by its being alone. This hill, in clear weather, may be seen at the distance of 7 leagues.

Mr. Lockwood, who surveyed these isles, says that under the lee of Virgin Gorda, the ground is so clear, that 300 sail might anchor in the space between the Dogs and the Valley. The North Sound, he adds, is a perfectly secure port, and of great capacity. The entrance between the two reefs is not difficult to discover.

ANEGADA, or ANAGADA, is the most northern of the Virgin Islands, and is unhappily celebrated for the number of wrecks, accompanied, in many instances, with a heavy loss of life, which it has occasioned.

Anegada is about the size of Virgin Gorda, but so low that its coasts are inundated at high tides, and it has not even the smallest hummock on its surface. You may discern over it two high hills on Virgin Gorda, which appear like a great hummock. There is good water on the low part, near the south point.

Within the last 20 years above 50 vessels, mostly American, have been lost on this dangerous island and the reefs surrounding it, which has been caused by the strong north-westerly current, which prevails there most of the time; its average set being about one knot per hour in that direction.

Those bound to St. Thomas, or any of the islands in that parallel, will find it necessary to take every opportunity of ascertaining their latitude at night, as, from the causes above stated, there will always be a great uncertainty in their position.

The whole of the windward side of Anegada is bordered with a dangerous reef, which thence continues under the name of the Horse-shoe, about 4 leagues to the S. E., and terminates at E. N. E., 7 miles from Point Pejaro, the east end of Virgin Gorda. There are swashes in the reef, but on many parts only 2 to 6 feet of water. On approaching the isle from the north-eastward, the hill on Virgin Gorda will appear over it like a great hummock, and by this mark the relative situation of a vessel may be known.

From the observation of R. H. Schomburgh, who has made a plan of this dangerous island, it appears that the greatest number of wrecks on Anegada occurs in the months from March to June, and that vessels of large burden strike usually on the reefs to the south-east, while smaller ones generally go on shore farther west, which he imputes to the wind which blows frequently from S. and S. E. from March to June, thereby increasing the north-westerly current, in consequence of which vessels bound during that time for these islands, are more subject to error than at any other period, and that light

bodies being more influenced by the current than heavy ones, is the cause of the small vessels going on shore farther to the westward.

FALLEN CITY, or OLD JERUSALEM.—A very remarkable cluster of broken rocks, to the southward of Virgin Gorda, bears this name. They appear to have been thus left by some great convulsion of nature. To the southward of these is a large bluff rock, called Round Rock, next to which follows Ginger Island. Between the two latter is the general entrance into Sir Francis Drake's Channel, which is called the King's Channel, it being the best passage inward for those bound to the Road of Tortola.

TORTOLA.—The following directions for sailing through the King's Channel to Tortola, have been communicated by Mr. Backhouse:

"To run through Sir Francis Drake's or the King's Channel, between the Round Rock and Ginger Island towards Tortola, so soon as you make the land of Virgin Gorda, steer for the S. W. end of it, W. N. W. northerly; and when you are within six or seven leagues of it, you will raise the high land of Tortola, and also the highest keys and islands to the eastward and southward of it; that is, beginning with the easternmost or Round Rock, Ginger Island, Cooper's Island, Salt Island, Dead Chest, Peter's Island, and Norman's Island.

Having these keys in sight, steer for the south end of Round Rock, which you cannot mistake, for within three or four leagues of Round Rock, you will raise the low keys called the Broken City, or Old Jerusalem, which keys extend from the S. W. end of Virgin Gorda, in a S. S. W. direction, to within two cables' length of the north side of Round Rock: these keys are the more remarkable, not having the least earth or verdure on them, but are merely heaps of large stones, resembling the ruins of a city or island

When at the distance of two or three leagues to the eastward of these keys, having the Round Rock N. W. westerly, steer for the south side of the rock, keeping it on board as you run through; that is, keep about one-third of the breadth of the channel from it towards Ginger Island: this caution is necessary in case of light winds, when strong leeward currents may hurry you close to Ginger Island. The course through is nearest N. W. by W. by compass. The Round Rock is a barren slate rock, and the eastern cliffs of Ginger Island are also full of slate. The channel is about half a mile over; you may pass safely within a cable's length of Round Rock, at which distance we sounded 14 and 15 fathoms, no ground.

Having passed Round Rock to the W. N. W. of you, on the island of Tortola, you will see a negro town, a white dwelling-house and a fort. Keep to the westward of this mark, steering W. by N. and W. As you run down towards Tortola, the easternmost point of Tortola Road bears nearest west, by compass, from the Round Rock, and makes as shown in the plate. You may see with a glass, at the same time, the fort and flagstaff on the west point of the harbor, from which extends a dangerous reef: the eastern point is a craggy bluff, with a footpath or road winding around it. The first soundings in running down, (with the handline,) were found abreast of the east end of Ginger Island, 15, 13, and 12 fathoms. The course from W. to W. by S., which soundings continued nearly to the east point of the road.

"It is particularly to be observed, that there is a bay to the westward of Road Harbor, called Sea Cow, or Rogue's Bay, which, by strangers, may be mistaken for the road, as the points make alike. Therefore, when drawing near the eastern side of Road Harbor, if you have any doubt, look to the S. W. quarter, and you will see four remarkable perpendicular rocks, called the Indians, off the N. W. end of Normand's Island, and bearing S. W. by S. (See the plate.) At this time the easternmost point of Tortola Road will bear nearest to W. N. W. ½ W. With this bearing on we sounded, and had 8 fathoms, about half a mile from Tortola. Come no nearer. We found no ground, after 8 fathoms, on the next cast with 14 fathoms of line; and, thinking it bold, we borrowed to the shore, having the point N. N. W., but again found that it had suddenly shoaled to 4 fathoms, then at 3 cables' length from the shore. Hauled off W. S. W. and deepened in two or three casts to 7 fathoms; and, at the fifth cast, no ground at 15 fathoms. Be cautious to keep at least half a mile from the point.

You now open the Road of Tortola, and keep your eye on the easternmost or weather shore of the bay. On the third bluff point in you will descry a battery, (Fort Shirley,) abreast of which ships of war anchor. Keep to the westward, until you open the next point to the northward of this, on which stands Fort George, or the citadel, with a flagstaff; bring this citadel, (see the plate,) north, westerly; then haul in and steer for it.

As you steer in for the citadel on the above bearing, keep in 10 fathoms of water; indeed the mark will lead you in 14, 12, and 10 fathoms. You anchor abreast the point of the first battery, with the battery bearing N. E., but the mark for letting go the anchor is the flag-staff of the battery on the west point of the bay, in one with the south end of the guard-house, which is close behind the battery: depth 10 fathoms and about one cable's length from the shore. The western battery will bear nearest S. W. by W., westerly. Moor with your stream to the N. N. E., because the ground is foul; and, should

you part your bower, your stream will check you into the bay, and clear the reef of the western point of the road.

The merchant's anchorage is in from 10 to to 13 fathoms, on the western side."

In proceeding outward, from Tortola, you sail outwards through the southern channel, between the west end of Normand's Island and the east side of Flanagan, or between the latter and the east end of St. John's Island.*

CURRENT, &c.—About Virgin Gorda, and the passage of the Virgin Islands, the current runs regularly, setting eastward during the moon's passage from the horizon to her zenith, and from her setting till she arrives at nadir, and to the westward while the moon passes from zenith to the horizon, and from nadir till her rising. The rate varies, according to the breadth of the channels, from two to five and a half knots, and the rise is from 20 to 40 inches.

ISLAND OF ST. JOHN.—This island is 2 leagues broad and 4 in length, has no heights or eminences of importance. The north and south coasts are cliffy, and the former rather foul; as is also the east coast. The island is said to be the best watered of any of the Virgin Islands, and its harbor, called Coral Bay, is reported to afford as good shelter as any harbor in the West Indies. An inlet on the west, having 4 fathoms within it, is a complete natural dock, where a frigate may careen or refit, lashed to the shore on each side.

The following description and remarks on this place have been extracted from those of Captain Hester:

"The east point of the harbor is called Moor's or North Point. The walls of the fortress upon it, which are white, may be seen from the distance of seven or eight leagues. From a little without Moor's Point quite into the harbor, there are regular soundings, with from 10 to 5 fathoms of water.

"With the wind any degree to the northward of east, you may lie into the entrance of the harbor: but if it be to the southward of E. S. E., you must anchor without the point, and warp in. The Governor's house and part of the town are not above half a mile within the point on the east side; but there is a large harbor, with lagoons, &c. above that; though English ships of war seldom go higher than the Governor's house. You anchor within a quarter of a mile from the weather shore, in 5 fathoms of water, good ground, and run a stream anchor to the S. W. by reason of the land breeze, which is, at most times, betwixt the S. S. E., south, and S. S. W. You moor N. E. and S. W.

"Observe, in coming in, to leave one-third of the channel to windward from Moor's Point, and two-thirds to leeward towards the key called Duck Island, and you will not have less than 5 fathoms of water.

"There is a small bank, which does not show itself, and lies directly off from the gate, at a cable's length from the shore, with only 10 feet over it. The watering place is at the south side of the town, just without the south gate, but it is brackish."

If you are bound to Porto Rico from the eastward, night coming on, and you off the E. N. E. part of St. John's, you will take notice of the easternmost high land; it is inland a little from the east end of the island, which is low. You may run to the westward till you bring that high land to bear S. by E., and then bring to till morning. But take great care that this high land does not deceive you, for it lies a long way in the country, and it is all low land by the water side. In the morning make sail; you may see the walls and works all white about Moor's Point.

From the south point of St. John's Island, called Ram's Head, to the entrance of St. Thomas' Harbor, the course is about W., five and a half leagues: from the north side of Santa Cruz, N. N. W. ½ N., ten leagues. The latitude of St. Thomas' town is 18° 22′ N.

ISLAND OF ST. THOMAS.—The eminences of this island are almost like those of St. John's, and descend gently towards the shore. The entrance into the harbor is very easy and commodious; the town has more commerce than any other of the Virgin Islands, and is always well supplied with every requisite, being a kind of warehouse or depôt of rich merchandise; it has a regular careening place, and is defended by a fort and several batteries.

In running down from St. John's to St. Thomas' Harbor, you leave Bird Key to the southward of you, and you continue your W. N. W. course till you come down to Buck Keys; they are much lower and longer than Bird Key, before mentioned, and there is a small opening of no consequence between them. You leave these keys to the southward of you † about one mile, and then steer N. W., when you bring them S. E., and con-

* Mr. Lockwood says, "In the passages and also in Drake's Channel, the current, running quick over the foul ground, causes a ripple, which wears the appearance of danger. The anchorage at Tortola is not good; and, when the convoys rendezvoused in that neighborhood, experienced masters of merchantmen, usually anchored under Peter's or Normand's Islands, both of which have good bays"

† The channel between the main island and Buck Island, is but one and a half mile broad, and

tinue that N. W. course about two or three miles till you bring the harbor open; then haul in for the town N. by W. or N. N. W., giving the east shore all along a good berth, and run within half a mile of the fort, which is white, and plainly seen at the east of the town. You anchor in 5 fathoms water, fine clear ground: it is a fine harbor, where you are landlocked from all winds, but from the S. by W. to the S. E. by S., which part lies open to the sea; but the wind seldom blows in unless it is in the hurricane months. There is a rock above water in the harbor's mouth, (called Prince Rupert's Cliff,) which you leave to the eastward of you; you may make bold with the west side of it, but there is no passage within.

From St. Thomas' Harbor, if bound to Porto Rico, being in the offing, steer W. by N. till you come down the length of the west end of the island, which is about 3 leagues from the harbor. You will see a small island called Little Passage, about 4 or 5 miles to the westward of the west end of Little St. Thomas. Little St. Thomas is a small island, that almost joins with the west end of the Great Island; there is a small opening between them, but of no note. There is likewise a channel of small importance between Little Passage and Little St. Thomas; but there are two other islands before you come down to the west end of that island. The easternmost, just to the leeward of the harbor, is called Water Island, and almost joins with the main land; about two or three miles to leeward of that, is a rocky island, about half a mile round, which lies a mile from the shore, and is called Little Saba; it is foul all round, and must have a good berth. All the shore along these islands must be left on your starboard hand. In running down till you pass Little Passage, you have soundings all the way, but deep in some places.

W. S. W. ½ S. from the mouth of St. Thomas' Harbor, above 4 leagues, and S. W. by S. 7 miles from the west point of the island, lies a remarkable rock in the middle of the channel. It is round, rugged, and double pointed, as high as Beachy Head, and may be seen 5 or 6 leagues off, being all white; it appears at some distance like a sail, whence it has been called St. Thomas' Carvel, or St. Thomas' Hoy. This rock is bold to all round, and appears at some distance like a sail, and may be seen 5 or 6 leagues off.

Remarks on the Passages in general, from the "Derrotero de las Antillas."

The straits between the Dogs' Isles and Virgin Gorda are all excellent, and are those by which the entrance into Drake's Channel is made from the northward. The channels to the southward are, that between Salt Island and the Dead Chest, or Peter's Island; that between Peter's and Normand's Islands; and that between Normand's Isle and Flanagan Key. The pass between the Dead Chest and Salt Island, when used for going out of Drake's Channel, requires the breeze to be steady, that it pass not from E. S.E. towards S.; for otherwise you will be apt to get entangled with Peter's Island, as the water sets strongly towards the strait which it forms with the Dead Chest, and the swell also aids, (which is likewise heavy, when there is a fresh wind,) as it diminishes the vessel's way, and increases her lee-way.*

Vessels which navigate by the south of the Virgins, commonly pass between Bird's Key or Frenchman's Cap and Buck Island; and all those who run for the southward of the Virgins for St. Juan's Head, in Porto Rico, pass through the channel between the Sail Rock and Savanna, or Green Island.

The sea along the whole of the west coast of Virgin Gorda, is tranquil during the time of the breezes, and you may anchor along the whole length of it, in the certainty of not having more than 16 fathoms, nor less than 8 fathoms at a mile from the shore, and the quality of the bottom is commonly sandy.

On the west coast of Normand's Island there is a harbor, Man of War Bay, which is much better sheltered and more secure than that of Virgin Gorda; for in it, and as far

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at the entrance, in the fair way, lies a rock, called Packet Rock, which is a hard whitish rocky shoal, the S. W. point of which is from the flag-staff on Mucklenfell's Battery, (the eastern battery at the entrance of the harbor,) S. 57° E., 2180 fathoms, and from the northern, or nearest point of Buck Island, N. 4° E. 1050 fathoms distance.

This sunken rock or shoal extends from its S. W. point in a depth from 6 feet water, E. N. E. upwards of 15 fathoms in length to 5½ feet—in the centre of the depth are 9 feet. From 5½ feet water it inclines a half point to the north, upwards of a quarter cable's length, with a depth of 12 and 9 feet water.

The whole shoal is consequently little above 40 fathoms in length, and has a direction of nearly E. N. E. and W. S. W; its position being one-third the distance from St. Thomas to Buck Island. The passage between this sunken rock and Buck Island is perfectly free, with good soundings from 10 to 14½ fathoms. The way to clear this shoal is to keep Buck Island close on board.

* But, it is to be noted that, at about half a mile to the E. N. E. of the Dead Chest, is a rock, having over it only 12 feet, and on which the Blonde frigate, and several vessels have struck.

as Flanagan Islet, the sea, during the breezes, is as calm as a bath. Within this harbor they do not experience gusts of wind, and it also appears that the breeze in it is light, when it is fresh outside. As the interior of the harbor is to windward of its points, and it is not more than half a mile wide, large vessels cannot beat up into it; and, therefore, when these come from the north, it is necessary that they should shave the point, and luff up and anchor in about the middle of the harbor's mouth, warping or towing in afterwards, if they have to make a long stay; for if not, they will lie very well at the very mouth, if it be not in the hurricane season. On coming in from the south, they must prolong the tack to the north, in the certainty that they will find no unseen danger; and when far enough, they must heave about to manœuvre, on the south tack, as already directed. If the wind with which you run to take this harbor should be from the north, you may run farther in, and lie as if in a dock; but it is necessary to furl your sail smartly; for with norths there are flaws of wind which might cause you to drive, and there is no room for manœuvring. Keep in mind that about a league to the S. S. E. of the S. W. point of Normand's Islands, there is a rock of small extent, which has not more than nine feet water on it. On this rock the frigate Santa Monica struck, and subsequently foundered. The situation of this rock is not well ascertained; for, though the brigantines under the command of Don Cosme Churruca made every exertion to find it, they never could succeed.

ST. CROIX, or SANTA CRUZ, is the southernmost of the Virgin Islands, and lies W. by N. from Sandy Point, in St. Kitts, 33 leagues. It is not very high, though full of hummocks, two of which, on the eastern side, are higher than the rest. At the S. W. end of the island, there is a flat extending outwards to the distance of a mile; and the whole of the south side is bordered with reefs, which render an approach dangerous to a stranger. The island is scantily watered: and with wood, which can be procured only at a high price.

There are two towns, one on the north and the other on the west side. The first and chief is Christianstæd, the capital of the Danish West India Islands, lying on the south side of a harbor, protected to seaward by extensive reefs, and on the land by a fortress.

The chief town, called Christianstæd, is situated at the bottom of a bay on the north coast, under the cannons of a fortress which defends the principal harbor. The other town, named Friderickstæd, lies on the west side, about half way up on the middle of a spacious bay, wherein ships may anchor at pleasure, in from 3 to 10 fathoms.

From the town of Christianstæd to the S. W. point of St. John's Island, the course is N. by E. about 10 leagues. In the channel, about six miles S. by W. of this point, lies a remarkable round rock, called Bird Key, which is about one quarter as large as Redondo, near Montserrat.

The harbor of Christianstæd is difficult of access, and shoal in several places. It is defended by the fort of Louisa Augusta, situated on a neck of land which trends from the eastward, and by that of Sophia Frederica, situate on Loqt's Key, an islet north of the town, under the guns of both of which, vessels must pass to the anchorage. This is one of the handsomest towns in the West Indies; its principal streets being wide, long, and straight, and intersect each other at right angles.

The greatest length of St. Croix, from E. to W., is 20 miles. On advancing, its north side presents a chain of eminences, almost like those of the Virgin Islands. At about a league to the W. N. W. of the East Point, and half a league from the north coast, there is an island, named Bokken, or Goat Island, which appears at a distance like a part of the coast. Between this island and St. Croix there is a passage, but it is bad and little frequented. The east point of Goat Island sends out a reef, a mile and a quarter to the E. S. E.; there are others stretching to the N. and N. W.

The west coast of St. Croix is clean; the south coast is very foul, and requires much practice, either to navigate near it, or enter into its bays, of which there are two, as shown on the chart.

To enter the port of Christianstæd much practice is required, and therefore a pilot must be taken.

ISLAND OF SOMBRERO.—Between the Virgin Islands and that of Anguilla, lies a small rocky island, about two miles in length; it consists of a very flat eminence, without any hummock upon it, covered with birds from the southward. You cannot descry this island farther off than 5 or 6 leagues at most.

This wretched island is rugged, steep, and barren; a little camphor and grass are the only vegetable productions which appear on its surface; the little water that lodges in the cavities of rocks during rains, soon evaporates. You may anchor on the west side of it. The cliffs are steep to, and are from 40 to 15 feet high. In 1792 an American brig ran against it and her crew crept from her yard arm to the cliff top. The brig disengaged herself, and drifted down to Virgin Gorda, where the hull and cargo became a prize to the wreckers.

The latitude of Sombrero is 18° 38′ N. and its longitude is 63° 30′ W. Two leagues off Sombrero, when it bears from E. N. E. to E. by S., is found from 35 to 22 fathoms,

uneven ground and rocky bottom. It lies about 14 leagues E. by S. from the island of Anegada, and 12 leagues due east from the reef lying off the S. E. end of it. In going between the two you have 5, 6, 7, 8, and 10 fathoms of water. The course from Saba to Sombrero is N. W. by N. ½ N., distant 20 leagues.

The passage to leeward or windward of Sombrero, is very clear and safe; there is no swell. The winds are generally favorable for going out, and when once you are past Sombrero, all obstacles are at an end.

Anguilla, and the Islets in its Vicinity.

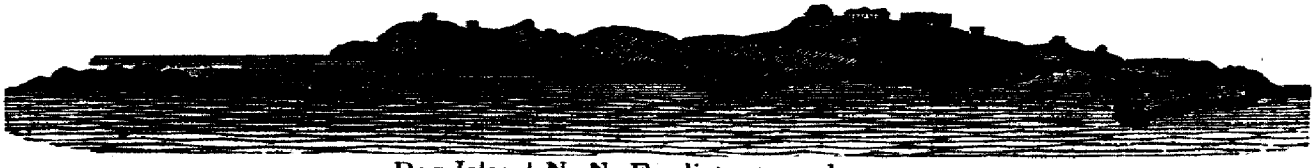
Anguilla lies E. by N. ½ N. and W. by S. ½ S. above two leagues to the north of St. Martin's: it is a low, flat and withered island, without any mountains, so that it cannot be seen farther off than 4 or 5 leagues. The anchoring ground is good on the south side, because the current there has no force, on account of a long ledge which stretches off S. E. from the east point. On the south part of the west point there lies, about one mile from the shore, a small island, not above 100 fathoms in length. To the N. W. by W. of the west point of Anguilla, distant about 4 leagues, lie several small islands, the principal of which are Dog and Prickly Pear Islands, between which is a good channel. The first is the easternmost; the second, which is the largest of all, lies farther than any of them to the west, save a little rock that is almost joined with it on the west side. It is about one mile in length, and has a few inhabitants. All these islands are very low, and cannot be seen farther off than 4 or 5 leagues.

Bearings taken and Remarks made in sailing between the above mentioned Islands, by an experienced Navigator.

"When we came to sail so far out, I found that the highest top of St. Eustatia came even with the top of Brimstone Hill, and that the two southernmost points of St. Kitts and St. Eustatia were in one, and bore N. W. by N. At the same time Fort Tison bore N. E., easterly, when Sandy Point, and Tumble-down-dick, or the northernmost part of St. Eustatia, came in one, and bears W. N. W.

"The direct course from the west end of St. Kitts is N. N. W. to St Martin's west end, and so through between the Dog and Prickly Pear. For when you are within half a mile of the west end of St. Martin's, the southernmost land of St. Bartholomew comes in one with the southernmost land in sight of St. Martin's, and they bear S. E. by E., and then Saba will bear S. by W., westerly. By the aforesaid bearings of St Bartholomew and Saba, if you see either of them, you may by them know how to direct your course for the west part of St. Martin's.

"The west part of St. Martin's and the west end of Anguilla, bear N. N. W., northerly. When the N. E. part of Anguilla, the north side of Prickly Pear, and the middle of Dog Island, bear all in one, it is east and west. Three miles north of Dog Island, I observed at noon, and found the latitude 18° 26′ N., and the variation 2° 30′ E. At the same time St. Martin's showed itself beyond Anguilla from E. S. E. to S. by W."



Dog Island N. N. E., distant one league.

The following particulars of Anguilla, &c. are from the Derrotero de las Antillas, &c. Anguilla is situated to the north of St. Martin's, and separated from it by a channel, of which the least width is four miles. It is extremely low, and has neither the smallest hill nor prominence. Its soil is very sandy and sterile, and both fresh water and wood are very scarce. The town is on the east side, near the N. E. end. It is very small, and has no commerce. The bay is shut almost entirely with reefs, and is therefore of very little value. To the N. E. of the east end, there is an islet, Anguillita, which is still much lower. It is very clean on its south side, and has 12 fathoms water on the side of the channel which separates it from Anguilla, which channel is nearly half a mile in width. On passing here, when running from windward to leeward, Anguillita seems part of Anguilla, and the strait between them cannot be seen until you are to the westward of the meridian of the former. Off the east end of Anguillita are four rocks, on which the sea breaks with violence, but they do not lie farther out than two cables' length, and at less than a mile there are 24 fathoms, on sand, gradually increasing to 30 fathoms at 4 miles.

The channel between St. Martin's and Anguilla is excellent, and fit for any class or number of vessels; for it has not less than 13 fathoms of water, and the depth is in general from 13 to 20 fathoms, of sand and gravel; and near both coasts it does not de-

crease to less than 7 fathoms. The only thing which is to be avoided is the Spanish Rock, lying within a mile from the N. E. end of St. Martin's, on the south side.

The British brig Saltoun, Capt. Melville, was wrecked off the island Anguilla, on a rock called Graffan, about one mile from Scrub Island, east of Anguilla.

ST. MARTIN'S is divided from Anguilla by the channel above described. It is divided between the Dutch and the French, and contains a great number of hills, or rather huge rocks covered with heath, which may be seen above 10 leagues off. The shape is very irregular, and the western coast is comparatively low. Rains very seldom fall here, and as the soil of the plains and valleys is sandy, they are consequently unfruitful. The island, destitute of rivers, has fountains and cisterns, which afford good and drinkable water for the planters. The air is very healthy, the shore full of fish, the sea rarely disturbed, and the anchorage safe every where about the island, especially with a N. E. wind. Wood is scarce and dear.

The principal town, Philipsburg, lies on the S. W. side, in a harbor called Great Bay, which has 8, 9, and 10 fathoms, good sandy ground. Near it are three salt ponds, where a great quantity of salt is made. This is the chief place of the Dutch quarter, the French quarter being to the north.

The Derrotero says, St. Martin's has many heights and hollows, but no mountain of consequence. On the S. W. side, in Philipsburg Bay, vessels anchor more commodiously than in any other in the island. The town, the capital of the Dutch part, extends in the direction of the shore. On the south side of this harbor stands an eight-gun fort, called St. Peters, and on the N. W. point is Amsterdam fort. These two forts defend the entrance. The harbor has from 3 to 4 fathoms of water, on fine sand; but on the line between the two exterior points, are from 6 to 9 fathoms, and vessels of a large draft go no farther inward than this line. About a mile to the S. W. of this bay is a rock named the Man of War, which has only 10 feet of water on it, and is about 2½ cables' length in circumference. The point of it on which there is the least water, may be found by bringing the S. E. point of Simson's Bay, which is to the N. W. of Philipsburg Bay, on with the high point of the westernmost mountain in St. Martin's; and on the opposite direction, by bringing the flag-staff at the Governor's house, which is at the eastern end of the town, on with another large house which stands on the top of the hills to the north of the bay. The last house may be known by its standing to the east of a great tamarind tree, which is insulated and separated from the other trees. In addition to these marks, it may be kept in mind that the shoal is exactly S. 38° W., true, from the White Point, which is the western point of the bay, and S. 6° 30′ E., true, from Fort Amsterdam. At a third of a cable's length around this rock, or shoal, 6, 7, and 8 fathoms, with rocky bottom, are found.

On the N. W. coast there is a bay named Marigot Bay, open to N. W. winds, and having a depth of from 4 to 7 fathoms, on sand: at the bottom of it stands the town of Marigot, which belongs to the French, and which is defended by a fort to the north of it.

To the east of the N. E. end of St. Martin's is an islet named Hat Island, which is very bare, and surrounded by reefs close round it. The channel between it and St. Martin's is a mile broad, and passable. The shoal named the Spanish Rock lies nearly two miles W. N. W. of Hat Island. This is a very small rock, the least water on which is 3 feet. When passing to the north of Hat Island, and near to it, in order to steer to the N. W., be careful to give a sufficient berth to the rock. The strait between this island and St. Bartholomew's is 10 miles wide. It is without shoals, sunken rocks, or any other invisible dangers; but those bound through it, and not destined for any of these islands, ought to leave to the south all the islets to the N. W. of St. Bartholomew's, and to the north all those of St. Martin's. The navigable channel is thus reduced to a league and a half in width. The ordinary depth, until touching the islets, is from 13 to 20 fathoms, but almost always upon rocks, and you may safely run within half a mile of the islets.—The navigation of this channel is excellent, not only for those going from windward to leeward, but also for those bound from leeward to windward; but attention must be paid to keep clear of the rock called the Man of War, before described.

ST. BARTHOLOMEW'S.—St. Bartholomew's S. W. end bears from Sandy Point in St. Christopher's, N. ½ E., distant 10 leagues. It lies E. and W., and is five or six leagues long. The middle part is very high land. Its shores are extremely dangerous, chiefly on the north part, where there are many rocks above and under water, and the approaching them requires an experienced pilot; but it enjoys the advantage of having a very good harbor, of an excellent hold, in which ships of any size are perfectly sheltered from all winds. The island of St. Bartholomew's appears at first almost round, and can be seen nine or ten leagues off. E. ½ N., fourteen leagues distant from the island, lies a large bed of rocks, about 20 yards square. On the west side of it is a swell. The rock is sharp pointed, and sometimes covered. When the sea falls, it is about four feet dry.

Vessels bound for this island from the eastward, should endeavor to run down the south side, and keep as near the shore as possible. There are several rocks on the

south side, but all above water, and bold to, the largest of which is a long flat key called Turtleback. From Turtleback round Point Negro, the coast is clear and bold.

Vessels bound in for the harbor should keep about 200 fathoms from the shore, and when abreast of the first battery, lay off and on and wait for the pilot. A stranger should not enter the harbor without a pilot, as the channels are narrow, and the winds often baffling.

There are three channels by which vessels enter the harbor, according to the winds, viz: South, South-west, and North-west Channels.

The South Channel has a good depth, but it is dangerous for a stranger to attempt, as a rocky reef extends from the middle key, called the Saints, two-thirds across the channel; but, should a vessel be compelled to run in without a pilot, keep the main shore close aboard, and anchor when within the second battery, in 4 fathoms. With the wind at east, the South-west Channel is the best, and with a N. E. wind the North-west Channel is the best, as it is the broadest of the three.

The north side of the island is perfectly safe; there are several keys and small islands, but the channels between them are all bold and free from danger with the wind at N. E.

I would recommend to those bound in, to run down the north side of the island, double the west point, and stand in for the harbor. The Baleine, or Whale, is a rock 150 fathoms west from the key called the Islets, in front of the harbor, is even with the water, and has a point standing up like the fin of a whale. Vessels can pass all around, within 10 fathoms of the rock.

On the west side of the island is the town of Gustavia, pleasantly situated at the foot of a hill, forming three different sections, and in the centre is the careenage, with wharves all around. On the south-west side of the water are several ship wharves, with conveniences for careening, caulking and carpenters' work well executed, and at a moderate expense. The careenage can contain 60 sail, and the road from 3 to 400 shipping, good holding ground, from 1, 2, 3, 4, 5, and 6 fathoms, sandy bottom.

About the island of St. Bartholomew the flood, at new and full moon, runs S. E., and it is then high water at 10h. and 30m. P. M., while the sun is farthest to the north of the equator, but comes about two hours sooner in the following months, till the sun gets farthest to the south, when it is high water at 10h. 30m. A. M., and it runs afterwards in the same proportion back again. The winds, which are of long continuance, sometimes make a trifling difference. The horizon is also lowest at the time when the sun is farthest to the north of the line: and so to the contrary. The greatest difference in the ebbing and flowing is 18 inches; but, in general, only 10 inches.

DANGEROUS ROCK.—S. 51° E., 12 miles from the S. E. point of St. Bartholomew's, lies a dangerous rock, nearly even with the water's edge.

SABA.—The island called Saba belongs to the Dutch. It is very high, and its shores bluff and clean. On the S. W. part is a small town, built in a plain, but hid from the sea by very high hills, except to the southward. A very high mountain constitutes the centre of the island. The island appears like a steep rock, of a round form; it is about nine miles in circumference, accessible only on the south side, on which there is an intricate and artificial path leading to the summit, which admits only one man at a time.

It is said that the bottom may be seen all round. On the N. W. side there is a rock, called the Diamond, standing at about a musket shot from the shore, and which appears afar off like a sail. There is an extensive bank of soundings, extending seven leagues to the southward and S. S. W. of the island, as shown on the chart, having on it, within that distance, from 12 to 17 fathoms. Beyond these soundings, to the south, no bottom is to be found. At four miles to the southward of the island there is a shoal spot of 3 or 4 fathoms, on which the sea breaks, during gales of wind, but the exact spot has not been ascertained.

THE ISLAND OF ST. EUSTATIUS makes, at a distance, like a steep rock, rising out of the sea, and in a sugar-loaf form, ascending upwards in a round hill, but, on a nearer approach, its figure changes, and it appears longer. The rock is composed of two mountains, whose middle land is pretty even. The eastern mountain is much higher than that to the N. W.; it is hollow in the middle, the excavation being the crater of an exhausted volcano, which has probably constituted the island: the bottom is pretty nearly on a level with the town, and is frequented by sportsmen in pursuit of game.

The town stands on the south side, and is divided into two parts, called the Upper and Lower Towns. The latter is on the shore; it consists of shops and warehouses, and is inhabited in the day only, as the inhabitants pass their nights and holidays in the upper town, 50 or 60 feet above the level of the sea, to which they climb by means of steps cut in the rock. The lower town consists of a single street, and is very indifferently built.

The anchorage, which is off the town, is not of the best; there is a swell when the wind blows from the S. E. quarter, and landing is rendered very difficult by the great and continual breaking of the waves against the shore. If bound into the road, give the eastern point a small berth, and anchor in 12 fathoms, before the town. The ground is mostly coarse sand and coral, and merchantmen buoy up their cables. The anchoring

marks are, the church bearing E. N. E., or N. E. by E., about three quarters of a mile from shore; and the west end of the bay, called Interloper's Cape, N. W. by N. Vessels may even anchor farther in the offing, in 14 or 15 fathoms, similar ground. The road is much frequented, and ships are often there, even in the hurricane months; but in this season, the wind must be attentively observed, as, on the smallest indication of a squall from the southward, they should immediately proceed to sea.

The Derrotero says, "This island shows itself from the S. W. The only hill which it has, is situated near the S. E. extremity, and extends to the west, descending tolerably gently, and comes down to the shore at the place where the town and anchorage is situated. The latter is so bad that, being open to S. and S. W. winds, (when the breeze even comes to the southward and eastward,) so much swell comes in as to incommode the vessels much, and prevent landing on the shore conveniently; the depth in this roadstead is from 7 to 12 fathoms, on sand, and vessels in it must remain at single anchor, ready to make sail the moment the wind comes on shore, which, however, does not frequently occur. The channel between it and St. Christopher's is excellent, and without any danger whatever."

NEVIS AND ST. KITTS are high, and their eminences may be descried at the distance of eighteen leagues; they are separated by the Narrows, a channel of half a league wide, but which, though there is depth enough in it for every class of vessels, ought not to be attempted by a stranger without a pilot, as it is obstructed by several shoals.

NEVIS is a small island, which may be readily known, being low on both sides, and very high in the middle. The top of the high land, which to those athwart it, N. or S., makes like a saddle, reaches far above the clouds. The plantations are on the sides of it, near the bottom. On the western side are two brooks of fresh water, and three tolerable roadsteads, on the principal of which, near the S. W. end, is Charleston, the principal town of the island.

As the shores of the southern and western sides are very low, ships must not approach near to them in the night, as they are not to be distinguished from the high land behind them. From the S. and S. W. points there are reefs stretching off to the distance of nearly half a mile, which, of course, must also be carefully avoided.*

The Narrows, or straits, between St. Kitts and Nevis, is rather more than half a league broad, and lies N. E. and S. W. Nearly in mid-channel, at the eastern end, there is a remarkable high rock, called Booby Island; and nearly one mile and a half to the S. W. of this island, are two others, called the Cows. The channel, which has a depth of from 3 to 12 fathoms, is between these rocks and St. Kitts; for on the southern side there are several shoals.

An extensive shoal, from a mile to a mile and a half in breadth, and five miles long, from N. W. to S. E., lies without the eastern end of the Narrows. The passages in are, therefore, between its north end and St. Kitts, and between its south end and Nevis. The southern half of the shoal, which is the broadest, is rocky, and has not, in some parts, a greater depth than 10 feet. There is also a dangerous patch of 18 feet of water, near the north end.

In sailing up to the Narrows, between this bank and the Isle of Nevis, bring Booby Island W. N. W., and keep it so until the Cows bear S. W. by W. This leads clear of the reef, whence you may proceed as shown hereafter. In sailing in from the northward, before arriving at the Narrows, Booby Island will be seen nearly in mid-way of the channel. In sailing downwards, that isle is to be kept on the larboard side, keeping over towards the shore of St. Kitts. The south part of Nevis, kept open to the westward of Booby Island, will clear the reef. The Cows are also to be left on the larboard side, keeping over to the shore of St. Kitts, in 4½, 5, or 6 fathoms, good ground.

The Road of Nevis is on the west side of the island. In approaching it from the southward, give the Fort Point, near Charleston, a berth of a mile, to avoid a shoal which lies to the southward of that point; then luff up, and anchor in from 10 to 7 fathoms, good ground, with the fort bearing S. E., the S. E. part of St. Kitts N. ½ E.; distance off shore, about one mile.

In running from Nevis to Basseterre, you will cross a bank, on the shoalest part of which there are 4 fathoms, or quarter less 5. It is not quite a mile over, and its middle lies S. by W., westerly, from the Nag's Head, or the south end of St. Kitts, two miles.

ST. KITTS.—The centre of this island is occupied by a great number of high and barren mountains, intersected by rocky precipices, and almost impassable, and among which there are several hot springs. Mount Misery, which is an exhausted volcano,

* The Derrotero reports that there is a shoal off the windward coast of Nevis, the situation of which has not been made known; all that is known of it being, that an English sloop touched on it at two leagues from the shore. It is added that an English ship of the line also touched upon a rock, nearly two miles S. S. E. from Nevis. This may probably be the same.

whose head is hidden in the clouds, is the highest of all these mountains, its perpendicular height being 3711 feet.* The assemblage of hills makes the island appear, on an approach from the sea, like a huge mountain, covered with wood; but advancing nearer, the coast becomes less abrupt, and the ascent of the mountains, rising one above another, will be seen cultivated as high as possible. The S. E. side, on sailing along at two leagues distance, appears like several detached islands. The N. W. part is the highest, but declines gradually to the sea.

The principal town is that of Basseterre, on the south coast, situate at the mouth of a river, which opens into a bay called Basseterre Road. Sandy Point Town, towards the N. W., is also a town of consequence. There is no harbor whatever, and, on the contrary, a surf continually beats on the shore, which is sandy, and prevents any tree or wharf being erected upon it, and also makes landing always inconvenient; sometimes dangerous. Owing to this, the inhabitants are under the necessity of landing and shipping heavy goods in the manner practised at Montserrat.

SOUTHERN SIDE OF ST. KITTS.—In sailing off the southern coast of St. Kitts, the following lands are to be particularly noticed, namely, the Nag's Head, or south end of St. Kitts, on which there is a high hummock; the high lands on each side of Frigate Bay, the bay at the northern end of the isthmus which connects the northern and southern parts of St. Kitts; Monkey Hill, a high mountain to the northward of the town of Basseterre; and Brimstone Hill, another high mountain, with a square fort on it, to the eastward of Sandy Point Town in the west.

In proceeding from the southern side of Nevis towards Basseterre, you may cross a bank lying off the Narrows, on which the least depth is about 4 fathoms. It is rather more than a mile in breadth, and its middle part lies nearly two miles S. S. W., westerly, from the Nag's Head, above mentioned. Advancing towards Basseterre, and having passed the south end of Nevis, the course will be N. W. by N. When off Frigate Bay, run in until the Nag's Head appears to the southward of the mountain in Nevis, or until the hummock on the Nag's Head appears on with the southern part of the top of the same mountain; keep this mark on until a single tree on the green ridge behind the town of Basseterre comes on with the edge of Monkey Hill, or begins to shut in behind it; you may then anchor in 10 or 9 fathoms, mud or clay, with the fort on the east side of the town bearing north, about half a mile distant, and the west point of the bay W. by N. Vessels from the westward, when bound for the road, may run in with the single tree above mentioned just open to the eastward of Monkey Hill; and, when the points of high land on each side of Frigate Bay begin to shut in on each other, the water will be found to deepen from 7 to 10 fathoms, after having passed over a rocky ridge into clean ground.

The following remarks on sailing from Nevis to Basseterre, have been made by Mr. Backhouse, "In sailing past the island of Nevis for Basseterre Bay, give the S. W. point a berth of a mile and a half, and steer N. N. W. and N. W. by N., and there is no danger. You may anchor in 7, 8, or 9 fathoms of water, coarse sandy bottom, with Fashion Fort bearing N. E., the Half Moon Battery N. W. by W., and the town N. N. W. You cannot wood nor water here."

Old Road lies five and a half miles to the westward of Basseterre. In sailing close along shore to this place, the embrasures of the low battery on Stony Point, (the eastern point of the bay,) will first appear. The town on low ground will then come in sight, with its houses intermixed with trees. The anchoring place is nearly mid-way between Stony Point and the town. In sailing to this spot, run first so far to leeward as to fetch it upon a wind, or nearly so; and then stand in under easy sail, directly for the gully to the eastward of the town; and when the church of St. Thomas, standing nearly a mile to the westward, is brought on with the flag-staff on Brimstone Hill, you may anchor, at about a cable's length from the beach, in 9 or 10 fathoms, stony, but good ground. Fresh water here is obtained by the casks being landed and rolled about 100 yards, then filled at the running gullet, and floated off to the boat. There is a great surf on the rocky shore.

The remarks made by Mr. Backhouse on Old Road, are as follows:—"Give the eastern point a small berth, and anchor a little to the eastward of a red house, abreast of a large gully, in 10, 11, or 12 fathoms of water. If you go abreast of the town, you will soon be off the bank. The mark for anchoring is Old Road Fort by the Red House N. by W. half a mile, and the extreme points S. E. and W. N. W. You cannot wood here, but watering is extremely convenient."

Sandy Point Town lies a mile to the westward of Brimstone Hill. Off this town, and to the eastward of it, the bank is narrow, and the ground rocky: the anchoring place is consequently to the westward, at about a cable's length from shore, in from 9 to 13

* The bottom of the great crater of Mount Misery is a level of fifty acres, of which seven are covered with a lake, and the rest with grass and trees; amongst the latter is mountain-cabbage. Streams of hot water, impregnated with sulphur, still issue from the fissures.

fathoms, and the mark for anchoring is, the street extending from the landing place, through the middle of the town, end on. In running along shore to the anchorage, you must cautiously avoid a reef stretching half a mile from Charles Fort Point.

Remarks made in Basseterre Road and Old Road.

In Basseterre, which is a large open bay, the marks of the anchorage are as follows: The long point of Nevis S. S. E., Nag's Head S. E., Bluff Point W. ½ N., the town of Basseterre north, distance off shore half a mile, depth of water 7 fathoms; wood purchased, water better and easier got at Old Road, about one and a half league from hence; tides none.

In Old Road the following are the marks of the anchorage, viz: the Long Point of Nevis S. E., southerly; Stony Fort E. S. E., the westernmost point of Old Road, N. W. by N., Stony Point S. E. ½ E. Depth of water where the anchor lay, 10½ fathoms, one third of a cable out—wind off the land; 13 fathoms under the stern—west distance off shore two-thirds of a mile. You land your casks, roll them about 100 yards, and fill them at a running gullet; then float them off to the boat. A great surf and a rocky shore.

BARBUDA.—The greatest extent of Barbuda, from S. E. to N. W., is 15 miles.—Its highest land cannot be discerned at more than six leagues off. The greater part of the coasts of this island are very foul and dangerous. In its proximities, it is not uncommon to sound with 50 or 60 fathoms at the prow, and have only 4 or 5 fathoms at the stern; the reef extends several miles to the S. E. from the island, and the rocky soundings continue to the south as far as mid-strait between it and Antigua, where 9 fathoms, on the same kind of bottom, have been found. To the N. and N. W. the reef extends outward to the distance of 5 miles, and here lie the wrecks of the British ship Woolwich, and of a brig, which was under the convoy of that ship.

There is anchorage in a well sheltered road on the western side, where ships may ride in 9, 12, or 14 fathoms of water; or within the reef in 3½ fathoms, four miles above Palmetto, on the south-west point. There is also anchorage off the S. W. coast, in 5½ fathoms, sandy bottom, with Palmetto Point N. W. by W. three miles, and Cocoa Point, the south point of the island, E. by S., 4 miles distant.

ANTIGUA, has, in general, a rocky shore, and is surrounded by many dangerous reefs. The climate of this island is commonly hotter, less healthy, and the hurricanes more frequent than those of Barbadoes. There being no rivers, and but few springs, and those brackish, the inhabitants are obliged to preserve the rain water in cisterns. Excessive droughts frequently impede and destroy vegetation.

Antigua, however, derives considerable advantage from the circumstances of having several excellent harbors, particularly English Harbor on the south side, which is capable of receiving the largest ships of war in the navy; here also is a dock-yard, with stores and all materials and conveniences for repairing, heaving down and careening ships. To the westward of English Harbor is the harbor of Falmouth, and to windward is Willoughby Bay. At the eastern end of the island is Nonsuch Harbor; and, on the north side, is the town and harbor of Parkham, &c. The coasts are, in general, very foul, especially on the N. and N. E., whence many reefs extend out to the distance of more than a league.

The town of St. John, on the N. W. side, is the capital. This town is situated on the harbor of the same name, in which there is a sufficient depth for merchant vessels, and perfect security in all winds. Ships from the eastward generally make for the S. E. coast of the island.

WILLOUGHBY BAY.—The first harbor on the S. E. side is that called Willoughby Bay, on the western side of which is a little island, called Sandy Island, environed to a short distance by sunken rocks. From the eastern side of the bay a long narrow reef extends more than two-thirds over the entrance, and to within a half a mile of Sandy Island. The passage is therefore between the island and the reef; and even in mid-channel between, there is a shoal having only 9 feet over it, called the Weymouth, which lies only half a mile from Sandy Island, on which the Mail Packet Maria was lost, and 20 persons drowned, in March, 1826. Between Sandy Island and this shoal, there is a depth of 4 fathoms: between it and the west end of the reef there are 7 fathoms, and the channel is wider. At a mile within the entrance there is good anchorage, in 4 and 5 fathoms; in going up, it is recommended to borrow toward the larboard shore.

ENGLISH HARBOR.—This harbor is perfectly safe, and lies close under the west part of the easternmost high land, so as to afford a shelter in all winds; and ships of war commonly lie here during the hurricanes. In the bay without the harbor, ships may anchor in 5, 6, or 7 fathoms. They must warp in, and cannot lie excepting N. N. E. There are, generally, flutterings of wind from the high land.

In entering the harbor, give the Old Horse-shoe, or low battery point, on the starboard side, a good berth, and keep as nearly as possible in mid-channel, between that and the opposite point, on which stands Fort Barclay, until you get into the bay on the eastern

side, called Freeman's Bay. In this bay there are moorings for shipping, and good anchorage hence up to the store-houses on the western side, in 3, 4, and 5 fathoms. The water is generally smooth. It is not, however, perfectly safe for a stranger to conduct a ship in, as the entrance is narrow and rather shoal. When you are off the harbor, a pilot, or the master attendant, will come on board.

Large ships lie at proper moorings, but small ones lie with one anchor to the E. S. E., and the other made astern, on shore. There are four moorings for ships in Freeman's Bay, just within the harbor's mouth, the best bower to the westward, and the moorings on shore to the eastward.

Wood and water are not to be obtained here. You may, however, obtain the latter at Falmouth, about a mile and a half to leeward. It is not very good, being soft, muddy and brackish.

FALMOUTH HARBOR.—To sail into this harbor, run close in towards the western point, called Proctor's Point, and you will pass clear of a ledge of sunken rocks called the Bishops, which lie toward the middle, just within the entrance, and terminate a shoal extending from the eastern point, on which there is a redoubt for the protection of the harbor; beyond these rocks there is good anchorage in from 3 to 6 fathoms water. There is a battery on an islet within for the defence of the town, on the western side of the harbor; beyond which there is a spring of fresh water.

Vessels bound to St. John's Harbor, from the south side of the island, on approaching westward, must give the coast a berth of 3 or 4 miles, until they come abreast of Johnson's Point, (the S. W. point of the island,) in order to avoid the dangerous reefs which lie about 2 miles from shore, eastward and north-westward of the point. If bound to the north-westward from English Harbor, the course to abreast of Johnson's Point is first W. by S., or W. S. W., about 8 miles; then hauling towards the N. N. W., and keeping the lead going, still keeping at the above mentioned distance from the island, steer for Sandy Island, the little island lying to the westward of St. John's Road, and about 7 miles N. by W. from Johnson's Point.

Or, in sailing from off English Harbor, to the westward, when to leeward of Falmouth Harbor, keep the small battery on the eastern side of the entrance of that harbor open with the western point of the same, until you are off Carlisle Bay, or Old Road. The bluff land of English Harbor being then kept open without that of Old Road, will lead clear of Johnson's Reef, in a depth of about 18 fathoms.

On the western side of Antigua, at about half way up, and nearly a league to the southward of Sandy Island, is a large harbor, called Five Islands Harbor, and so called from a cluster of five remarkable little islands, which lie nearly in a line, about half a mile east and west, off the point on its south side. About three-quarters of a mile to the northward of the harbor, and close in-shore, is another conspicuous little island, called the Hawk's Bill. When you have approached so far to leeward with the mark above mentioned, namely, the bluff of English Harbor kept open without that of Old Road, as to have the Hawk's Bill open to the westward of the Five Islands, you will be clear of the reefs, and may tack up towards Sandy Island. In approaching this island, keep it on your starboard bow, in order to avoid several shoals extending to the distance of a mile from shore, to the N. W. of Five Islands Harbor.

Should the wind permit, you may run within Sandy Island; but it is better for strangers to go to leeward of it, at the distance of not less than two cables' length, so as to avoid a reef which stretches from its southern side to the S. W. Be careful not to stand above three miles to the northward of this island, lest you be caught by a lee current, or touch on the shoals which lie to the northward. By keeping in 15 fathoms, you may pass clear of the island in the night.

ROAD OF ST. JOHN'S.—This roadstead lies about 1½ mile east, a little northerly from Sandy Island. It lies in lat. 17° 10′, or very nearly so. The western point, on the south side, which forms the bay, is called the Ship's Stern, at about a mile north of which there is a dangerous ledge of rocks, with not more than 3 feet water over them, called the Warrington. Here are breakers in a wind.

The road lies to the southward of the Warrington Rocks, and has a depth of from 6 to 10 fathoms. The anchorage, which is 2 or 3 cables' length within the rocks, lies with the Ship's Stern S. W. by W.: Fort James on the north point of the entrance of the harbor E. S. E.: and the Warrington N. by W., or with the flag-staff of Fort James on with the north side of the island in the harbor, called Rat Island, where there are from 5 to 7 fathoms water, and good holding ground.

The middle of the Warrington Rocks lies with the northern part of the buildings on Fort James on with Rat Island above mentioned. Close to the westward of them, in the depth of 9 fathoms, the largest of the Five Islands appears open to the westward of the Hawk's Bill. The western part shoalens about a cable's length from the breakers, but the eastern part is bold to.

Ships bound to the road stand on upon a wind for half a mile above Sandy Island; then tack, and run close in to the Ship's Stern; but be sure not to get farther to wind-

ward than to open the Hawk's Bill without the land, or to bring it in a line with the easternmost of the Five Islands. When thus far in, if standing to the northward towards the Warrington, you must tack so soon as the flag-staff of Fort James appears on with the middle of Rat Island.

To sail up within Sandy Island, bring the westernmost of the Five Islands N. by E. ½ E., and keep them open on the starboard bow, which will lead clear of danger.

At the distance of a mile from the westernmost of the Five Islands, you will be in the channel; keep Sandy Island, as before mentioned, on the starboard bow, until you open the Hawk's Bill, and then luff. The eastern side of Sandy Island is nearly bold to, and in the day, the shoaling may be seen. The Ship's Stern is bold to. After the Hawk's Bill bears E. by S. you may haul up as near to it as you choose, there being 11 fathoms of water close to it. In steering for the harbor, keep along the south shore, which is all clear.

There is a bar at the entrance of the harbor, which stretches from the north side S. W. to the land on the south side. The deepest water, 14 feet, is on the southernmost part of the bar. The depth on the northern part is about 12 feet.

NORTHERN SIDE OF THE ISLAND.—The northern and western coasts of Antigua are environed by numerous reefs, (as shown on the chart,) between which and the land there is a good channel for shipping. At the N. E. part there are also a number of small islands, of which two or three of the outermost are called the Bird Islands. The whole are encompassed by reefs, which render them inaccessible to shipping. Of the latter, the northernmost is a narrow ledge, part of which is sometimes dry. This ledge stretches N. E. about a mile from the northernmost Bird Island A shoal of 3 fathoms lies about three-quarters of a mile to the northward of the end of the ledge, between which and the Bird Islands Reef there is a clear channel of 8 and 6 fathoms. The white water from the shoal may frequently be seen at the distance of a mile and a half.

The HARBOR OF PARHAM lies at the distance of 2 miles westward of the Bird Islands Ledge. This harbor, though large, will admit small vessels only. The town is situated on the south side of the harbor.

A little island, called the Prickly Pear, lies off the west point of the entrance of Parham Harbor, and about 4 miles due west from the north end of the Bird Islands Ledge. In advancing towards this island, and thence to Boon's Point two miles to the westward of it, be sure not to get over to the northward, as the reefs on that side are extremely dangerous, and in some parts, not more than a mile from the coast.

From Boon's Point to go clear of the Warrington Rocks, on the northern side of St. John's Road, the course and distance are W. S. W., southerly, 4 miles.

The NORTHERN LEDGES off the north coast of Antigua, commence with the rock called Addison's Rock on the east, and terminate with the reef called the Diamond Reef on the west. Addison's Rock is a shoal, having on some parts only 4 feet of water, and lying nearly north of the fort on Barnacle Point, upon the western side of the entrance to Parham Harbor. It has a depth of about 3 fathoms around it. Within a short distance, N. by W., westerly, from Addison's Rock, there are two other shoals of about 3 fathoms: and half a mile thence, west, is a reef, sometimes above water, and called the Horse-shoe. This reef bears north, one mile and a quarter distant from the Prickly Pear, close to the westward of the Horse-shoe, and between it and the great cluster of reefs which stretch to the westward, there is a channel of 5 fathoms.

At a short distance to the westward of Beggar's Point (the point to the southward of the Prickly Pear) there is a wind-mill: and at the distance of one-third of a mile to the S. W. there is another. These mills form the mark for sailing through the channel on the western side of the Horse-shoe; and steering S. by W. between them, will lead a vessel through.

A small shoal of only 5 feet of water, lies S. W. by W., at the distance of nearly a mile and a half from the Horse-shoe, and nearly at the same distance N. W. by W. from the Prickly Pear. There is also a shoal stretching half a mile from the western side of the Prickly Pear, which may be seen during the day.

Capt. Bradshaw has observed, that there are so many shoals and rocky spots without the great reefs above mentioned, that it is dangerous to come too near. That, in particular, called the Diamond, lies a mile to the west of the reef, and in the channel between you have 6 and 5½ fathoms. You will be in this channel whilst you keep the western side of the leeward Sister in a line with the flag-staff of James Fort. The Diamond is of a circular form, and one mile in extent: the depth of water over it is from 1 to 9 feet. To avoid it, when coming in from the N. W., bring the Ship's Stern to bear S. by E. before you haul up with the fort, and then look out for the Warrington Rocks. If the wind will serve, you may pass close to the westward of the westernmost Sister, and you will thus weather the Warrington, which bears north, above a mile from the Ship's Stern. The westernmost part shoalens from the breakers a full cable's length, but to the eastward it is bold to.

Remarks on the Coast of Antigua.

[From the Derrotero de las Antillas.]

On approaching Willoughby's Bay, upon the S. E. coast, great caution is required, in order to avoid its rocky shoals, and a pilot will be requisite for strangers who enter here.

From this bay the coast continues to the westward very clear, and in it you will soon find ENGLISH HARBOR, which is an excellent port, having a dock-yard and careening place for vessels of any size. The straight of this harbor is about a cable's length in width, and in the middle of it there are from 4 to 5 fathoms, and 3 fathoms at a quarter of a cable from the points. After English Harbor, that of FALMOUTH follows, and thence the coast begins to be foul, sending out to more than two cables' length from it, very dangerous rocky reefs. Thus it continues to CARLISLE BAY, or the Old Road. From Carlisle bay to Johnson's Point, the south-west point of the island, the coast extends to the north, but has a rocky shoal, of the length of 2½ miles, which lies at a mile and a half from the coast. Between this shoal and the coast there is a passage fit for any vessel, but it ought not to be attempted without a pilot.

From Johnson's Point the coast continues to the north, to the FIVE ISLANDS, on the south side of the harbor of that name; and another shoal of rocks and sand extends between these points, which lies about a mile and a half from the coast. The depth between is very unequal, and the navigation therefore dangerous.

From the Five Isles the coast forms a great bay, named Five Islands Harbor, of which the north point is called Pelican Point. At about two miles to the N. N. E. of this point, is the point called the Ship's Stern, which is the S. W. point of St. John's Bay. Between the two points is a sand bank, which extends out above a mile from the coast, and its edge is nearly on the meridian or south of Sandy Island, an islet two miles to the west of the Ship's Stern. A reef surrounds Sandy Island, and is three-quarters of a mile in extent from N. E. to the S. W.

Two miles to the N. E. by N. of the Ship's Stern are two islets, named the Sisters, which are three-quarters of a mile N. W. by W. from Corbizon's Point, on which there is a fort.

Between the two Sisters and Sandy Island, and just within this line of direction, is the rocky shoal called the Warrington, which has, in its shoaler part, not more than 3 feet of water.

The town of St. John, situated at the bottom of a bay of the same name, is the capital of the island, and centre of its commerce. We, therefore, give directions which may guide any one to the anchorage. The north coast of this island is very foul, as already noticed: it is, therefore more advisable, on advancing, to make the island on the south side, and direct your course so as to pass about two miles to the south of its southernmost points, and continue steering true west, but nothing to the north, until the westernmost part of the Five Islands bears north, when you may luff up to N. N. W.; with which course you will pass about a mile from the outermost part of the Irish Bank, a shoal of sand and rock, and you will follow it until the Five Islands bear east; when, if the wind allows, you will steer so as to pass about two cables' length from the S. E. side of Sandy Island, taking care not to pass to the eastward of N. E. by N., that you may keep clear of the sand bank, which extends from the coast between Pelican Point and the Ship's Stern, until Sandy Island bears north, when you may luff to the wind all you can; and, if you can, place the vessel's head towards the Ship's Stern Point, which is very clean, and follow on towards the road within, and anchor in 5 or 6 fathoms water, nearly south from the Warrington Shoal. If, when passing between Sandy Island and the coast, the wind will not permit your approach to the Ship's Stern Point, you may follow the tack until Fort Hamilton, which is the middle one of the three standing on the coast to the north of the town, bears east; then go about on the other tack, and continue beating, taking care not to prolong the north tack more than until Hamilton Fort bears east; or go about even rather sooner: but the south tack you may follow until you are within a cable's length of the shore of Ship's Stern Point, for it is very clean.

If, when to the west of the Five Islands, the wind will not permit you to pass to the S. E. of Sandy Island, you must steer to the north until the north point of Sandy Island bears east, southerly, and then you will haul by the wind, and prolong the stretch until you can weather Sandy Island on the other tack; and having weathered it, you will beat in as above stated; that is, on the north tack, until you are nearly west of Fort Hamilton; and on the south tack, to within a cable's length of the coast, near the Ship's Stern.

To proceed to the northward, from the road of St. John, it is necessary to give a berth to the rocky shoal called the Diamond, and others, which extend west almost to the meridian of the Warrington; and the northernmost part of which is nearly five miles distant from the Ship's Stern Point. To effect this, you must steer from the anchorage about N. W. by N., but nothing to the north of that, until Sandy Island bears from south

towards east, and then you may steer north, which you will continue until the Sisters bear S. E. by S., when you may haul to the wind, and pursue your route, according to destination.

If, having made the north part of Antigua, you wish to anchor at St. John's, you ought to steer true west, passing outside of all the shoals; that is, avoiding the north coast by about four miles, until Sandy Island bears south, a little easterly, when you may steer towards it, until you are due west from the northernmost land of Antigua; thence steer for Ship's Stern Point, and so run, until, being something to the south of Fort Hamilton, you may haul by the wind, or shape the most convenient course to gain the anchorage.

The channel between Guadaloupe and Antigua is most excellent, and does not offer the least danger.

The channel between Antigua and Barbuda, on the contrary, is, at times, dangerous, particularly between May and November, during which season, no one should pass through it, because there are many calms in it, alternating with very heavy squalls of wind; and, as the depth of the channel is so unequal, and the bottom frequently rocky, an anchor cannot be let go when the calms come on, and the risk is incurred of being driven upon the rocks, either on one side or the other, by currents that may occasionally prevail here.

MONTSERRAT AND REDONDO.—There is no harbor in the Island of Montserrat, and the greater part of the coast is so encompassed with rocks, as to render riding dangerous, in case of a hurricane or tornado. The principal roadstead is off the town, and there are two others shown in the chart, namely: Old Road and Ker's Bay; but in all these a surf beats continually on the shore. Large heavy goods are therefore landed and shipped by means of a boat, called a Moses, manned by expert rowers; who, when they see what is termed a lull, or abatement of the surge, push ashore, and lay the broadside of the Moses on the beach, so as to roll out or admit the hogsheads, &c. Cotton, rum, and other commodities, which will bear the water, are generally floated off or ashore.

It has been recommended to those who lie near this island, when the state of the atmosphere indicates an approaching tornado, to get under way for Antigua, or St. Christopher's, according to the wind and other circumstances.

The Spanish description says, "Montserrat, which lies nearly S. S. E. and N. N. W., is a great rock, formed by two mountains. The N. E. part is remarkably high, scarped, or cliffy, and clean. The island has not the smallest bay, nor any breakers, except they break upon the very shore, which you may come so near as almost to touch it, without the least risk. The N. W. point is also high and scarped, (or cliffy,) and bluff. The highest parts of the island may, in clear weather, be seen at the distance of fifteen leagues.

The S. E. part is higher than the N. W., but it has a gentler declivity, and where it joins the sea is rather low; the south part is also very clean; but, when the breeze southeasts, the sea breaks upon it with much force. The road is an opening of some depth, which affords shelter only when the breeze is N. E. This renders it impossible for large vessels to anchor in it, and none frequent it but some small ones, to carry away the produce of the island, which they take to Antigua.

REDONDO, which lies three leagues to the N. W. from the north end of Montserrat, is a very high, round, barren, and uninhabited rock, having the appearance of a haycock, and which may be seen from the distance of 9 or 10 leagues. There is anchorage on the west side of it, in the depth of 11 fathoms. You may approach the isle on either side, it being steep to. On the S. E. side is a little islet, called the Pinnacle, which is nearly joined to the land.

AVES, OR BIRDS' ISLAND.—This little solitary isle, which takes its name from the multitude of sea fowl with which it is always covered, lies, according to the Spanish chart, in lat. 15° 50′, and long. 63° 43′. It is extremely low, and surrounded by a sandy beach. In the middle it is somewhat higher than at its extremities, and has some trees. There are reefs on its S. E. and N. W. sides, which extend out to a short distance, and on which the sea always breaks. The length is about three cables, from N. to S., and nearly the same from E. to W. The height is about 12 or 15 feet above the level of the sea. At the western part of it there is good shelter from the sea, where a vessel may anchor in 10 or 12 fathoms of water, on a sandy bottom. This island may be seen, in a clear day, at 3½ or 4 leagues off, but the flight of birds, at the setting of the sun, will always point out its situation.

Father Laval says, that there is anchorage on the S. W. side, at half a pistol-shot from shore; in 3½ fathoms, white sand. He adds, there is neither pond nor a spring of fresh water on the island: but, it is supposed, that by digging at the distance of 150 or 200 paces from the shore, water might be found.

On the west and N. W. sides, are two islets, or barren rocks, white with the dung of birds, which resort there. These islands are connected to Aves by shoals and breakers, which may be seen.

Mr. James Finlaison, (M. R. N.,) describes the Isle of Aves as follows:—"The Island of Aves lies in lat. 15° 40′ N., long. 63° 33′ W., variation 4° 20′ E.; it is a low small island, about three-quarters of a mile in length; you will not see it farther off than six or eight miles; broken water extends from both ends of the island, about half a mile from it. Ships must be careful that they keep near the parallel, in the night-time, as it is impossible to see it, being so very low; there is a slight covering of grass on the top."

The position of Aves, as given in the French Tables, is 15° 30′ 18″ N., and 63° 38′ 17″ W. The mean of the three statements is 15° 40′ N., and long. 63° 38′ W. A positive determination seems to be still a *desideratum*.

GUADALOUPE.—The form of Guadaloupe is very irregular, as shown by the Chart, and the land is divided into two parts by an arm of the sea, called the Rivière Salée, or Salt River; a stream diminishing in width from 50 to 15 fathoms, and of which the soundings are in some places deep enough for a ship of five hundred tons, whilst, in others, there is scarcely water enough for a bark of fifty. The length of this strait is about two leagues, and no scene can be more pleasant than the passage; the water being clear and still, and the banks on each side lined with mangroves and palmettos, which afford excellent refreshment, and shelter from the heat.

The western division of the island, which is the most important, is divided into two parts, by a ridge of very high rugged mountains, extending north and south; so high, indeed, that the continual cold suffers nothing to grow but fern, and some useless trees covered with moss. Towards the south point there appears, in the middle region of the air, a mountain called La Souffeiere, or the Sulphur Hill, which is about 5,500 feet in height, above the level of the sea. This mountain exhales a thick black smoke, mixed with sparks, visible in the night. From the mountains flow many streams, that carry fruitfulness into the plains, and attemper the burning air of the climate.

The eastern division of the island, distinguished by the name of Grand Terre, has not been so much favored by nature as the western part: indeed, it is less rough, and more level, but it wants springs and rivers; the soil, more sandy, is not so fertile, nor is its climate so healthy. Its principal town, Port au Petre, or St. Louis, is a place of considerable trade.

The chief town of Guadaloupe is that named Basseterre, situated on the west side, near the south end of the island.

The English ship Temple, being at anchor at Basseterre Road, had the westernmost part of the Saintes and some part of the western side of Dominica in one, bearing S. E. by S.; Montserrat, at the same time, bore N. W., northerly, and the westernmost part of Basseterre Bay N. W. by N., distant one mile.

The Flore, French frigate, being moored N. N. E. and S. S. W. in this road, in 1772, in 7 fathoms, sandy ground, and the small anchor in 37 fathoms, similar ground, had the following bearings by compass: The fort to the S. W. of the town, S. E. by E.; the church N. E.; the N. W. end of the town N. by W.; Point Irois N. N. W.; and the southernmost point of Dominica S. E. by S.

Should you be bound from the road of Basseterre to Antigua, the best way is to weigh at night, and sail at such a distance from the shore as to keep the land wind, that it may carry you to the northern part of the island by morning, where you will have the sea wind to carry you across. Should you act otherwise, you may be caught by the baffling winds from under the high lands. Off the N. W. point of Guadaloupe there is a small but remarkable high rock, called Tête a la Anglois, or Englishman's Head; it appears gray, and particularly distinguishes this coast, and there is no passage within it.

Remarks on Guadaloupe.

[From the Derrotero de las Antillas, &c.]

This island, the mountains of which may be seen in clear weather at the distance of 20 leagues, is divided into two almost equal parts, by a channel navigable solely for boats and canoes. The eastern part is named GRAND TERRE, and the western part is subdivided into two, by the mountains; the east being named Cabes Terre, and the west Basseterre. The capital of this island is St. Louis, or Point a Petre, on the western part of Grand Terre, at the south entrance of the Rivière Salée, or channel, which separates it from Cabes Terre. The anchorage of Point Petre is sheltered, and vessels which have to remain at Guadaloupe winter in it. In the hurricane season it is necessary to have a pilot to take this anchorage. If bound to it, you proceed towards the town of St. Louis, taking care not to get to the west of it, but keeping to the southward and eastward, that is, you must make it to the N. W. of you.

On the S. W. point of Basseterre stands the town of the same name, which is the most considerable in the island, and the centre of its commerce. This is the reason why it is generally resorted to. The anchorage here is a very incommodious unsheltered roadstead, where there is a constant swell: its bottom, at the edge, is so steep, that at two cables' length from the shore, there are 80 and 100 fathoms. The ground is not good,

and these circumstances make it necessary to keep close to the shore, and let go one anchor in 20 or 30 fathoms, on clay, and hang to it, without letting go another, that you may be ready to sail the moment that winds from the S. E. quarter come on.

From the anchorage of Basseterre, you may approach as near to the west coast as you choose, so far to the northward as the hill named Gros Morne, which is the N. W. extremity of this part of the island.

Every one bound to Guadaloupe ought to take the south part of it, for the principal commercial ports are on it. If bound to Point a Petre, you ought to approach within two miles of the south coast, or Grand Terre, and continue at that distance to the Point and Bay of Fergeant, on which is the town of St. Louis, whence you ought to take a pilot to carry you into Point a Petre.

On this coast there are two roadsteads, with towns at them, the first called St. François, and the second St. Anne's. Between the last and Fort Louis there is another town, a little inland, named Le Gosier, which is nearly north from an island of the same name. From this island to the west, in about two miles of the coast, are 6 or 8 fathoms of water.

If bound to Fort Royal or Basseterre, direct your coast so as to approach Cabes Terre about Point St. Sauveur; then follow the coast at the distance of a mile, or thereabouts, and pass about half a cable's length from Point du Vieux Fort, or Old Fort Point, which is the southernmost point of Petit Terre, and luff up immediately when round it, in order to keep at the same distance, of half a cable's length from the coast, until you are opposite the town, where you must anchor.

It ought to be observed that, when sailing either to the northward or southward, to leeward of Guadaloupe, you ought to keep within two miles of the shore, as by doing so you may have the advantage of a light land-breeze, which will be almost always sufficient to pass it before day; but, getting farther off the coast, it is no uncommon thing to be four or five days absolutely becalmed. Any one who is not able to get near the land of Guadaloupe, that is, within the distance of two miles, must positively pass at 7 or 8 leagues from it to avoid the calms.

POINT PETRE.—Point Chateaux, the easternmost land of Guadaloupe, is composed of irregularly shaped rocks, some of which appear ready to tumble over into the water. From this point you may keep down the south side of the island, within about two miles of the shore, until you pass an island called Le Grosier, which is the first island you come to, and between which and the main island there is no passage, and only a small opening. From this island to near the harbor, you may go along in the edge of the white water. When up with Isle Le Grosier, you will discover a building on a hill near the water, which is called a fort, although it has not much the appearance of one. About a mile, or a mile and a half from the fort, is the entrance to the harbor of Point Petre. In sailing along here, you will, if not too far off shore, observe an island so low that the mangrove bushes appear to stand in the water, from which a reef extends off some distance to the westward. A little to the westward of the last is another island, larger and higher, with cocoanut trees and some houses on it, where the pilots stop, from which a large reef extends off in an easterly direction. Between these two reefs is the entrance to the harbor. A little inside the low island are several large square buoys, near which you pass, leaving them all on the starboard hand. There are several islands to the westward of those already mentioned, among and around which the ground is foul, so that vessels lying off and on should keep to windward.

While I was on shore my mate sounded in 3 fathoms, on a small piece of shoal ground, nearly S. by E. from the entrance to the harbor. Point Petre is one of the best in the West Indies, and pilots are readily obtained.

THE SAINTES, MARIE-GALANTE, DESIRADE, &c.—These islands are dependencies of Guadaloupe, from which island Marie-Galante, the principal, is 11 miles distant. The channels between them are generally clear and deep.

THE SAINTES.—The assemblage of little islands, called the Saintes, or All Saints, were so denominated from having been discovered by the Spaniards on All Saints' Day. They are bold to, and so happily arranged as to form as fine a road for shipping as any in the neighborhood.

The two largest islands are called Terre d'en Haut, or the Upper Land, and Terre d'en Bas, or the Lower Land. The first is the easternmost, and contains the town, or rather village, which is situated about half way down, on its western side. Between this town and a small island to the N. W. is the anchorage, which is nearly half a mile broad, and has a depth of 16 to 14, 10, and 6 fathoms. On the Terre d'en Bas is a neat wooden church, with two convenient creeks for anchorage and landing.

The islands have constantly a fresh breeze, let the wind blow from what quarter it may.

On the S. W. side of the upper island is a mountain, called Mont de Filles, the summit of which is 813 feet above the level of the sea, and which is therefore a proper station for a signal post. To the N. W. of this mountain, on the north coast of this island, is a remarkable promontory, called the Sugar Loaf, which serves as a guide to ships coming

in from the northward; for bearing S. W. by S., it leads between a rock, called the Whale, and a bank lying more to the north-westward, at the entrance of the channel, within which ships may haul round to the road.

In passing out hence to the westward, keep over towards the south shore, in order to avoid a shoal which lies at the distance of a cable's length from the south point of the island to the north-westward.

It is said that there is a sunken rock lying a mile and a half to the northward of these islands, of which the particulars are unknown.

MARIE-GALANTE.—The land of Marie-Galante is of moderate height, and it rises gradually towards the north. On the south and eastern sides are several sunken rocks and dangerous reefs, some of which extend nearly a league to sea; but the western side is a fair shore, with good anchorage in several places. The town, Basseterre, which is protected by a fort, stands on the S. W. point of the island.

Along the eastern shore are lofty perpendicular rocks, that shelter vast numbers of tropical birds. The western shore is flat, and the ground, in general, is proper for cultivation. It has several large caverns, where crabs are found, with many little streams and ponds of fresh water.

DESIRADE, OR DESEADA.*—This is a small rocky island, destitute both of wood and fresh water, but whereon some cotton is cultivated. The island lies nearly E. N. E. and W. S. W., shaped like a galley, the eastern end making like the head or prow, and the western end like the tilt. But on advancing towards the north side, some white broken patches will appear, like heaps of sand with red streaks in them. On this side there are some rocks under water.

There is anchorage off the S. W. part, at a mile and a half from some houses standing near the shore. You may anchor in from 5 to 7 fathoms of water, taking care to look out for a clear spot, as the ground is rocky. When at anchor, Petite Terre will bear south, easterly, and Point Chateaux W. by S. The latter is the easternmost point of Guadaloupe, and may be known by a hummock on it. Between it and Desirade there are 22 and 23 fathoms of water.

Notice to Navigators.

New light-house on Petite Terre, near Guadaloupe. Navigators are informed that on the 10th July, 1840, a lenticular fixed light, of the third order, was lighted on the eastern end of Terre-de-bas, one of the islets of Petite Terre, near Guadaloupe. It is in lat. N. 16° 10′ 29″, and long. W. from Greenwich 61° 05′.

The lantern is 108 feet above the level of the sea, at high water, spring tides, and is visible in fine weather, 5 marine leagues.

The light bears S. 36° 45′ E. from the extremity of Point des Chateaux, the eastern point of Guadaloupe; from the western point of Deseada, it bears S. 5° W.; and from the eastern point of the same island, S. 32° 15′ W.

The reef, called Baleine du Sud, which is the most southerly, and the most distant one from Petite Terre, bears from the light S. 19° W., distant half a mile.

The soundings to the eastward of the light are from 13 to 20 fathoms, at the distance of 2 miles; nearer than which it should not be approached.

E. & G. W. BLUNT.

PETITE TERRE is a small sandy island, divided into two parts by a shallow channel. It lies directly in the fair-way, or in a line between the eastern coast of Marie-Galante and the Isle Desirade. Captain Bishop has said, "There is pretty good anchorage by Petite Terre, to the westward, at 2 miles from shore, in 7 fathoms of water."

DOMINICA has, properly speaking, no harbors; but there are good and safe anchorages along the western side, all of which is bold. Ships are, however, exposed to westerly winds, as in the other islands; but those winds prevail only in the winter months.

The chief town is that called Roseau, or Charlotte Town, on the S. W. side of the island. In its road vessels may anchor in from 15 to 25 fathoms, good holding ground.†

Between 3 and 4 miles from the north end lies a noble bay, called Prince Rupert's Bay, from the famous Prince Rupert's anchoring there, which, besides its safety, its magnitude, the depth of water, and the goodness of the anchorage, has the advantage of three fresh rivulets running into it. Fleets destined to other parts of the West Indies commonly come to anchor in this bay, for the purpose of supplying themselves with wood and water, for which there are excellent conveniences.

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* Properly Desiderada. It was the first land which Colombo made on his second voyage to America, and he gave it the name of the Desired Island, because he had for a long time before been beating about in this vast tract of waters, without seeing any thing but sea and skies.

† This is the description formerly given, but Mr. Backhouse describes as follows: "There is no danger in going in, and there are 6 and 7 fathoms at half a cable's length from shore. You lay one anchor in 7 or 8 fathoms, the other in 40 fathoms. very bad ground. The anchoring mark is to bring the fort N. E."

Scot's Head, or Point Cachacrou, the south point of Dominica, is a high rock, having a flag staff on it, which, from a distance, appears like an island.

The town of Roseau is about 6 miles to the northward of Scot's Head, and will be readily discerned when sailing along shore. Merchant ships generally anchor in the bay off the south end of the town, but ships of war in the smaller bay to the northward, called Woodbridge Bay, abreast of a gibbet erected near the beach, and appearing on with the middle of a large cane-field. To come to an anchor here, run in under easy sail, nearly opposite to the gibbet, and let go the moment you get proper soundings.

The course and distance from Roseau to Prince Rupert's Bay are nearly N. N. W., 17 miles. The coast between is generally bold and steep.

BARBADOES TO DOMINICA, &c.—If you are bound to Dominica from Barbadoes, you must steer N. N. W. till you have passed Martinique, and a N. W. course will then carry you to the northward of Dominica. Leaving Marie-Galante on the starboard side, haul up close in with the north point of Dominica; you will see a round bluff making like an island, at some distance; go round that bluff, and you open the bay; turn into the north part, and anchor in 7, 8, or 9 fathoms. You will see the mouth of a large river, which anchor to the northward of half a mile, and you will be opposite a small river, which you water at, the best in the bay; the great river is brackish. There is another river to the southward, where you may anchor in 6 fathoms, clear ground; but in 10 fathoms you will have coral rocks.

The north point, above referred to, is that called Cape Melville; and the bluff is Prince Rupert's Head, which forms the north side of the bay.

When turning into the bay, its southern side will be in sight; which is a low point with a remarkable high hill over it, called Rolla's Head and Hill. Prince Rupert's Head, on the north side, is distinguished by two fortified hills, called the Cabrits, which are connected to the main by a low marshy neck. At the bottom of the bay, which is a mile deep, is the town of Portsmouth, consisting of houses irregularly placed: westward of Portsmouth, on a rising ground at the inner part of the marsh which connects the Cabrits to the main, there is a small plantation, called Cotton Hill, with a few small houses. Over the town appears two high sugar loaf hills, to the southward of which is a high mountain, whose summit is involved in clouds. To the southward of Portsmouth, at the distance of nearly a mile and a half, and on low ground near the beach, is a plantation, called Picarde Estate; and nearly midway between Picarde Estate and Rolla's Head is a fine plantation, called that of Mount Allen.

Nearly midway between Portsmouth and Picarde Estate, in the valley on the southern side of the two sugar loaf hills that appear over the town, is the river called Indian River, which falls into the bay.

When working into the bay, you may stand boldly over, from side to side, which is a distance of nearly 3 miles. The bay is rather more than a mile deep. Prince Rupert's Head and Rolla's Head are both so steep that either may be approached to the distance of a ship's length. When off Mount Allen, you may stand towards it so as to bring a single tamarind tree, which stands to the northward of the middle of Portsmouth, on with the highest land behind it. You may stand towards Picarde Estate, until a little hill to the west begins to open with the cultivated part of Mount Allen Estate, without the western edge of Rolla's Hill. When standing towards the marsh, between the Cabrits and Cotton Hill, you should tack in 9 or 7 fathoms, according to the ship's draft.

From the inner part of the Cabrits, round the bay to the western side of the cultivated part of Mount Allen Estate, a shelf stretches from the beach, which is, in general, a cable's length broad; off Indian River, is a cable's length and a half; at about that distance there are 3 fathoms of water; thence it gradually deepens to 5, 7, and 10 fathoms, and then suddenly to 15, 20, and 25 fathoms. The clearest ground is in the shoal water; for without the depth of 10 fathoms it is rocky. The best anchorage is off the tamarind tree, as above mentioned, and the coast seen over the low land within the Cabrits, on with the western part of Cotton Hill, or on with the drain at the western end of it. Should you be to the southward of the tamarind tree, you must run in until the highest ground on the western side of the cultivated part of Mount Allen Plantation is open without the western side of Rolla's Hill. With either of these marks the ground is muddy, and the depth is from 9 to 7 fathoms. There is anchorage farther out, in from 12 to 20 fathoms, fine dark sandy bottom, at from one to three cables' length from shore, with the tamarind tree E. N. E.

There is good fishing and good hauling for the seine throughout the bay. The water of the small rivers is to be preferred, that of the larger being brackish.

Remarks from the Derrotero, &c.

The Derrotero says that Dominica is the highest of all the Antillas: it has much wood, and is very fertile. All its coasts are clean, and you may approach within less than a mile of them. On the west coast they experience great calms, which extend 6 miles out at sea; and here it is necessary to navigate under moderate sail, and with much

caution, on account of the heavy gusts that abruptly proceed from the openings and valleys of the mountains; for, if caught, you may sustain serious damage from them. This island has neither harbor nor secure anchorages; the best are those of Roseau, on the south part of the west coast, and Rupert's Bay, in the northern part of the same coast; in both roadsteads they anchor at less than 2 cables' length from the shore, and in front of the towns; there is no need of instruction for going to them, for there is no hidden danger.

After what has been said of the calms and gusts of wind on the west side, it seems that the best way to avoid them will be, for those bound to Rupert's Bay, to make the north part of the island; and for those bound to Roseau, to make the south. The channel between Martinique and this island offers no danger whatever; and the currents set to the N. W., but they are of little importance.

ST. ESPRIT REEF, in lat. 14° 37′ N., long. 58° 59′ W., so named from having been discovered by the captain of the French ship St. Esprit, in 1817, and afterwards supposed to have been sounded on, as mentioned in the 12th edition of this work, from on board of H. M. ship North Star, Lord Wm. Paget, in February, 1833. It appears, however, that the reef does not exist, as Sir George Cockburn despatched the Ariadne, Sapphire, Vestal, Forte, and Victor, H. M. ships, then on the West India station, in January, 1834, and after a close examination, the captains reported no such shoal could be found.

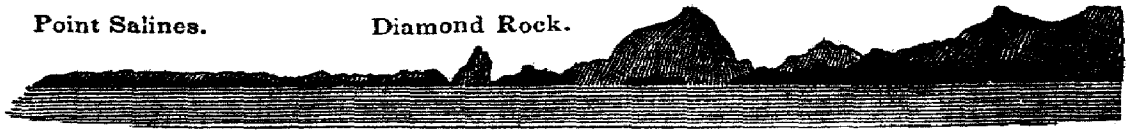
MARTINIQUE is about 12 leagues in length, and lies N. W. by N. and S. E. by S. Its breadth is extremely unequal, and scarcely any where more than 4 or 5 leagues; and if you include the promontories, which project in many places one or two leagues beyond the rest of the island, its circumference will include above 30 leagues. The land is very uneven, and every where intersected with large hummocks, in the form of sugar loaves. Three mountains rise above these innumerable hummocks, the highest of which has been a volcano; it appears like the crown of a hat, and may be plainly seen from every side of the island.

The principal towns are those named St. Pierre (St. Peter) and Fort Royal, both on the western side of the island. The latter, which is very advantageously situated near an excellent harbor, and under cover of a peninsula entirely occupied by a fort, is the residence of the governor. It stands on the north side of a deep bay, called Cul de Sac, or Royal Bay, and is situated to the N. W. of the fort. A little harbor on the east of it is called the Careenage. Here are all the conveniences for refitting ships of war.

On every side of the island are large bays containing good harbors and sandy coves; but some of them do not afford protection during the hurricanes.

The DIRECT and TRUE course from the north end of Barbadoes to Point Salines, the south point of Martinique, is N. W., distant 31 leagues; but the course to be taken, should be N. W. by N., to allow for a lee current. Point Salines is low, and has off it three rocky islets; when these bear west, you may see between them and the point. To the westward of the islets there are several dangers.

The Diamond Rock, which lies off the S. W. point, is, according to the description of Captain Hester, about twice the size of the cupola of St. Paul's, in London, and nearly as high. To the N. E. of it is Great Diamond Cove. There is no sailing within the rock, but on the south side it is bold.



Martinique: the Diamond bearing W. by N., and Point Salines distant 2 or 3 leagues.

Having made the Diamond, the course thence to Port Royal Bay is N. N. W., 3 leagues. The track is free from danger, and the shores bold. When you see the bay open, haul up, and the fort will be in sight; turn up towards it until it bears N. by E. or N., when you may anchor on a bank in 8 fathoms, or off the bank in from 14 to 17 fathoms, which is the best ground. The bank has coral on it, but is not rocky.

FORT ROYAL BAY.—The bay of Fort Royal, by its position on the west side of Martinique, affords a shelter from the reigning winds. During the whole of the dry season, its different anchorages offer all the same degree of safety during this part of the year, and we have no other motive in preferring one place to the other for anchoring, than the superior facility of entering or leaving which some places afford over others, and their neighborhood to places with which we wish to communicate. It is different during the rainy season, when we have to fear gusts of wind and sudden changes in the atmosphere. At this season we must renounce the advantage of coming to anchor in favorable situations for getting a ship under sail, and must seek a refuge in a situation

sheltered by surrounding land, secure from the accidents to which we might otherwise be exposed. We shall presently point out, among these anchorages, the most secure ones, and the means of entering them.

The Bay of Fort Royal is nearly 5½ miles wide between Point Negro and Cape Solomon, which we shall regard as its western limits. It narrows so, that as we reach the middle of its length, it is reduced to two miles in width, and preserves about this mean breadth. Its greatest depth is nearly 7 miles, in an E. S. E. and W. N. W. direction. This great bay of water encloses a multitude of banks of gravel and coral, which encumber it, and greatly diminishes the navigable part. These banks produce a change in the color of the sea, by which they are easily known, and serve as a guide through the passes, which they limit. They are generally very perpendicular, and form irregular curves.

Fort Royal, the capital of the island, and the seat of government of the colony, is situated on the north side of the bay, and 1¼ mile E. N. E. of Point Negro. This city, of which the population is nearly 4000, without including the garrison of Fort Bourbon, is built on a low flat piece of ground, formed probably by the alluvial deposits of the River Madame, which forms its western boundary. It is bounded south by the sea, east by the careening place, north by a canal which serves to communicate with the careening place, the stores of the port, and the River Madame. The streets are straight, and crossed by others at right angles. At its eastern extremity, near the careening place, there is a fine parade called the Savannah, which forms the glacis of Fort Saint Louis, elevated, like the rest of the ground, only 3 or 4 feet above the surface of the sea.

Fort St. Louis (on which there is a light) is built on a peninsula, terminated on all sides by steep rocks of a considerable height, especially on the western part. This peninsula extends 660 yards south of the Parade, and separates the careening place from the German Anchorage, which is situated between the city and Point Negro. It is not accessible from the land, except by a narrow isthmus, which joins it to the Savannah. On the east side it is defended by a bank of gravel and madreporic rocks, which stretches S. and S. W. about half a mile.

The German Anchorage has for its limits to the north, after leaving Point Negro, a coast of middling elevation, whose almost perpendicular shores terminate before reaching Madame River, by a little wharf built for a landing place. Farther to the east, near the peninsula of Fort St. Louis, and on the site of the city of Fort Royal, we find the soil composed of grey sand, which is terminated by a handsome beach, where you can land with great facility at all times.

The anchorage extends westwardly as far as the Virgin Bank, situated 6 cables' length S. S. E. from Point Negro. It is bounded south by the Mitau Bank, and near Fort St. Louis by the banks from this fort. On the western extremity of these banks is a pier, anchored in 19 feet water, and 6 cables' length S. 35° W. from the flag-staff of the fort.

From Virgin's Bank to the southward of the church of Fort Royal, the soundings decrease gradually from 154 to 41 feet, on a line, on which the flag-staff of Fort St. Louis bears N. 54° E. This line indicates the best place to come to anchor. If you quit this line, either to the N. or S., you will find, at different distances, the madreporic rocks, which are dangerous to come to anchor on, on account of the asperities of the bottom. Some of them rise suddenly 50 feet above the bottom of mud by which they are surrounded.

It is on this line of bearing relative to the flag-staff of the fort, and nearly S. ¼ W. of Madame River, in from 90 to 110 feet water, that government vessels usually anchor. The vessels of commerce usually approach nearer the fort and the Savannah.

You can, if necessary, anchor on the Mitau Bank, the length of which, in an E. and W. direction, is half a mile, and the mean width three cables' length; but you should anchor about the centre of the bank, in from 8 to 9 fathoms, as this part offers few irregularities, and where the risk of damaging your anchor and cables is less. In anchoring too near the edge of this bank, you will expose your cables to be cut, and your anchors to be caught in the crevices of the rocks. For greater security, however, we advise you not to anchor on this bank, except with a chain cable.

The highest part of this bank is covered with 24 feet water, and is situated one mile S. 36° W. from the south extremity of Fort St. Louis.

We are not certain that Virgin's Bank is composed of madreporic rocks. The highest part of this bank has 51 feet water.

With the winds from E. to E. N. E., which almost always blow here, you cannot reach German Anchorage without making several tacks, but this offers no difficulty, for there is only one dangerous bank at the entrance of Fort Royal Bay, which is the Bank of Gros Islet, on the shoalest part of which are 21 feet of water. This bank is situated one mile and seven-tenths north of Islet Ramiers, and about the same distance from Point Negro.

The permanency of the winds from the east, from November to July, makes the German Anchorage perfectly safe. It is only in the months of August, September, and

October, that it is necessary to quit it and seek refuge in the careenage, at the Three Islets, or at the Cohe du Lamentin, which we shall presently describe.

The port of the careenage, by its situation east of Fort St. Louis, affords a shelter from all winds which would endanger a vessel at the German Anchorage. It is a little bay, four-tenths of a mile wide, bounded west by the peninsula of Fort St. Louis, and east by Point Carriere. A point of small height divides this bay, near the marine establishment, into two parts, one of which communicates with the canal which surrounds the city, and the other, which is more spacious, is encumbered with banks of gravel and madreporic rocks. The port of the careenage extends from the mouth of the canal to the north and south extremity of Fort St. Louis. Its width is scarcely a cable's length at its entrance, and diminishes gradually, so that vessels stationed there, the number of which is oftentimes very great, have not sufficient room, and are obliged to preserve their respective situations, to moor to anchors, secured to the foot of the walls of the fort.

There is, at the entrance of the careenage, a little to the north of a line from Point Carriere, to the extremity of Fort St. Louis, a coral bank, which narrows very much the anchoring place. This bank is situated east of the barracks of the fort; is near a cable and a half's length from N. N. E. to S. S. W., and has only from 8 to 9 feet water on it at its shoalest part. Its north point is marked by a pier.

The channel of the careenage is between banks of gravel and madreporic rocks, which extend on one side four cables' length south of Fort St. Louis, and on the other side three cables' length S. S. W. from Point Carriere. Small vessels find here space enough for beating in, but others should not attempt it except with a leading wind.

We advise you not to pass the Grand Seche Shoal. It is probable, however, that the shoalest part has not less than 20 feet water.

South of the mouth of Monsieur River, and in a bend of the Grand Seche Shoal, is an excellent anchorage, where you can anchor in 70 to 80 feet of water, with a bottom of clayey mud. This anchorage is bounded north by the banks extending from Point Carriere, at the entrance of the careenage, and south by the southern part of the Grand Seche Shoal.

Near Point Salle is the entrance to the Cohe du Lamentin, a bay extending $1\frac{6}{10}$ of a mile N. N. W. and S. S. E. Its greatest width perpendicular to its length, is $1\frac{1}{2}$ mile, and the entrance seven-tenths of a mile wide. The River Lamentin winds through drained lands, and enters the bottom of this bay.

One-quarter of a mile S. S. W. from the entrance of the River Lamentin, is Point Milh, remarkable for a handsome building situated on the highest point.

Many banks of gravel and rocks occupy a considerable space in the Cohe du Lamentin: the largest extends from Point Milh W. S. W., 4 cables' length, dividing the bay into two parts, where you can anchor on a bottom of mud, with excellent holding ground.

The next anchorage, that of the Three Islands, is one of the most important in the bay of Fort Royal. This anchorage is easily known from the appearance of the surrounding land, and particularly by a small island, called the Great Islet, which is situated half a mile from the south side of the bay, and south from Red Hill, 2 miles distant. Great Islet is composed of two distinct parts; the first part has a round summit, and descends gradually to the sea; the second part, on the contrary, has an abrupt rise of 70 yards from the bed of the sea, and is terminated on the top by a little rocky plateau, covered by a slight vegetation, composed of small bushes and herbs, dried up for the most of the time by the sun. The anchorage, as well as the village of the Three Islands, takes its name from three small islands situated near the coast, forming a triangle. By its position, defended by banks, which break off the sea caused by westerly winds, this anchorage is a very safe one during the rainy season, but it contains a number of banks, which diminish the space of the anchorage. The place for anchoring to which we give the preference, is on the middle of a line drawn from the eastern of the three small islands to the top of Great Islet. In going farther south, we meet with banks reaching almost to Great Islet.

A bank of gravel and madreporic rocks, covered with but two to three feet of water, surrounds almost entirely the western part of Great Islet, and extends to within five and a half cables' length of Point Rose. This bank limits to the N. and E. the anchorage of the Three Islets.

From Point du Bout S. 56° W., is the Isle Ramiers, a rock elevated 25 yards above the sea. It is separated from the coast by a channel about a cable and a half's length wide, and in depth 8 to 9 feet. A fort, built on the highest part, defends the entrance to the bay.

Between the Diamond Rock and Port Royal Harbor there are three small coves, the southernmost of which is called Little Diamond Cove, and the others Grand and Petite Ance d'Arlet, or Arlet Coves. At the S. W. corner of the harbor there is a small green islet, strongly fortified, called Islet Aux Ramiers, or Pigeon Island, from which the fort bears nearly N. by E. In working into the harbor, by keeping the lead going, and having weathered Pigeon Island, you may anchor at pleasure.

On the south side of Pigeon Island there is a little roadstead for small vessels. In order to gain this place, those who are well acquainted go round the N. E. point of the islet, and turn in. The south shore is steep. The anchorage lies with the western part of the isle bearing north, N. by W., or N. N. W., in 7, 8, and 9 fathoms, clear ground. Be cautious of approaching too near the eastern shore, as a bank stretches from it, which breaks with a great swell.

Description of the Bay and Harbor of Trinity, by Monsieur Monier.

Leaving the Island of St. Mary, the coast trends about E. 60° S , to the bottom of the Harbor of Trinity, which is distant from this island 3½ miles, and is defended by a border of reefs which surround it in almost every direction. It forms little bays of small depth, separated from each other in many places by high steep points, in other places of but middling elevation; among others we distinguish Fort Point, situated towards the north part of the City of Trinity.

You will remark, before arriving at the bottom of the harbor, an islet, distant from the preceding coast three-quarters of a mile, lying near a mile and a half north of Fort Point, and a little more than that distance from the Islet of St. Mary, from which it bears S. 58° E. This islet, known by the name of St. Aubin, indicates the entrance of the harbor of Trinity, to vessels coming by the Dominica Channel. Its appearance and position make it easily distinguished. It appears high and steep in all parts, and its highest part is covered with bushes, mixed with a few trees. You can go on the north side as near as you please, for it is perfectly safe on this side; but, on the south side, it presents a great shoal of madreporic rocks, scattered towards the edges with projecting irregular rocks, many of which are at the level of the sea. At the south part of this shoal, which stretches near half a mile S. of the islet, is a bank of white sand, formed, probably, by the attrition of the blocks of coral detached by the violence of the waves.

The Island of St. Aubin is also inaccessible at the E. S. E. side, because of a chain of shallows which extends about 2½ cables' length off, and on which the sea often breaks. This chain, covered with 14 to 21 feet of water only, forms the western limit of the channel which leads to the anchorage.

From whatever quarter you may come, you may be directed in the proper course to take for the harbor of Trinity, by the view of a rock, which, from a distance, appears like a vessel under sail, and for this reason is called Carvel Rock. This rock, elevated 96 feet above the level of the sea, is totally devoid of vegetation, and distinguished by a pointed summit, whitened by the dung of the numerous flocks of sea birds. It is an excellent distinguishing point for every vessel from Europe or the United States, bound to Trinity, or to any of the anchorages of the eastern coast, because it is to the windward of all the anchorages and ports on this part of the island. The depth of water around it being considerable, you can approach it as near as you wish, but the swell of the sea, caused by the direct and permanent action of the trade winds, renders landing almost impossible.

A channel more than a mile and a half wide, exists between the Carvel Rock and the east part of a peninsula to which it has given its name. This peninsula, remarkable for its great projection from the east coast, forms the harbor of Trinity by its junction to that part of the coast near the Island of St. Aubin, and separates this anchorage from that at the bottom of Galleon Bay, by an isthmus, but little elevated, and only half a mile wide, on which is the plantation of Beau Sejour, and also a wind-mill, which is one of the most remarkable objects in the neighborhood of Trinity. The Carvel Peninsula extends in a direction E. 27° N., near six miles; the land increases in height towards the E. as far as Tartan Hill, situated about the middle of its length, the highest point of which is 623 feet above the level of the sea; from thence the land decreases in height, and again rises in a very sensible manner towards the east extremity; and throughout the whole extent shows in general a vegetation much less vigorous than the other parts of the island. To the north of the peninsula the reddish steep shores, of little elevation, form the edges of many straits; in other places are sandy bays, in which you cannot penetrate by reason of the reefs which border them, or the swell of the sea, which insinuates itself in the small intervals where the reefs are interrupted.

Tartan Bay, situated near the islet of this name, is the largest and deepest; but the coral rocks by which it is encumbered almost every where, leave only a narrow pass, practicable only for boats.

Opposite the harbor of Trinity, a chain of madreporic rocks stretches from the extremity of the Carvel Peninsula towards the Sugar Loaf Rock, in a direction generally W. N. W. Its surface is unequal in many parts, forming shoal banks of great extent, which cause a very heavy sea. The most remarkable of all is the Loup Ministre; we have sounded there in 10 feet, and profiting by the circumstance of very calm weather, we estimated the shoalest part at 7 feet. This shoal part is always indicated by heavy breakers, and in general they can easily be distinguished from a vessel's deck or masts, otherwise, far from being an object of apprehension, it contributes the better to judge of

the position of the dangers relative to the coast, and the distance it is necessary to keep to avoid them, when bound into the harbor of Trinity.

The term Loup (Wolf) used at Martinique to designate the preceding shoal, is usually applied to all the banks covered by a small quantity of water, and on which the sea breaks at intervals. We shall have occasion to use this term frequently in a further description of the coasts.

Between the Loup Ministre and the north part of the Carvel Peninsula, the bottom is covered with banks of different sizes, on many of which we found but 3½ fathoms of water. It is not necessary to pass them in entering or leaving the harbor of Trinity, for as you would be obliged to pass the great chain of madreporic rocks, of which the Loup Ministre forms a part, you might be exposed, in passing, to some dangerous rocks, which may not have been discovered by us in sounding, or receive a great shock from the sea, should the wind freshen ever so little.

There exist south of the Islet of St. Aubin, more than half a mile off, a bank extending S. S. W. and N. N. E., over half a mile, and on which we found 24 to 22 feet water. Here the chain of shoals, which lies off the Harbor of Trinity, ceases. A bottom of white sand is found, immediately on the west side, in 15 to 18 fathoms water, and stretches W. N. W., the general direction of the reefs, to the Loup St. Mary, situated N. N. E. of St. Mary's Islet, a mile distant. This shoal occupies a space of three cables in length by one in width, and the shoalest water we found on it was 32 feet. It is best, however, not to pass over it, notwithstanding the great quantity of water by which it is covered: for the sea there is always heavy, and oftentimes breaks, particularly when the winds blow from the E. N. E. to the N. E. strongly from these points: the soundings are at the least 25 fathoms less than a cable's length from the Loup St. Mary; and in the channel which separates it from the islet, the depth of water varies from 18 fathoms to 9.

The passages between the Loup Ministre, the Loup St. Mary, and the Islet of St. Aubin, are at least a mile wide, and are frequented by vessels bound to Trinity; but it is very important not to get in with the chain of the Loup Ministre, for you would expose yourself in passing over the shoals where the soundings are scarcely 4½ fathoms, to very great danger from the sea. You will take the precaution to keep your distance until the Islet St. Aubin, bears S. ¼ E. (true) at the distance of nearly 2 miles. The directions given by this course being very near the west part of the banks of which we have just spoken.—You should not deviate from this course to the eastward, (whether you have a fair wind, or must beat in,) till you open the Island of St. Aubin to bear S. ¼ E. at six or seven cables' length distance.—You may then stretch towards the southern limits of the madreporic rocks, and when you are W. N. W. of the Loup Ministre, and you have got sufficiently to windward, to be N. E. ¼ E. of the small island of St. Aubin, and W. of the Loup Ministre, you must steer S. ¼ W. for this anchorage, guiding yourself, however, through the passage by the sight of the reefs which line it east and west. You may come to anchor east of Fort Point, between the two chains of reefs, and in the whole space comprised between this position and the bottom of the harbor the anchorage is excellent; it is sheltered from the prevailing winds, which generally vary only from the N. E. to the S. E., passing easterly. The winds from the N. and N. ¼ E. are the only ones which cause any swell, because their direction is the same as that of the entrance, but these winds blow very rarely, and are not to be feared, except in the winter season.

It is oftentimes more difficult to get out of the Harbor of Trinity than to enter, particularly when the winds are E. N. E. Taking care, however, to tow your vessel so as to approach as near as possible to the banks which limit the anchorage to the east, which may be done without inconvenience, as these banks are to windward; you will then be able to double a little rock detached from the reef which surrounds Fort Point, and on which there are but 7 fathoms of water. After having passed to the north of this danger, which is about two cables' length E. N. E. from the fort, the passage will present much less difficulty, as the pass widens much, and is marked through the greatest part of its extent by lines of breakers, which border it almost without interruption. The Mitau Bank, covered with 11 feet of water only, and the banks to the E. S. E. of the Islet of St. Aubin, are the only dangers which the breakers do not render always apparent; but it is not necessary to prolong your distance as far as the Mitau Bank to pass clear of the banks of the Islet of St. Aubin.

Once outside of the Islet of St. Aubin, you will make your course westward of the Loup Ministre; and in case you want to go towards the entrance of the Dominica Channel, you may pass inside of Loup St. Mary, or outside, opening the wind-mill of Beau Sejour a little to the east of the Islet of St. Aubin to avoid this bank.

The reef to the south of the Islet of St. Aubin, does not extend to the shore. Between it and the border of breakers which surrounds the coast, there is a channel of about a cable's length or more wide, and in which the soundings are from 5 to 6 fathoms, with a bottom of white sand. This narrow passage is frequented by boats; as for vessels, they should not attempt it.

The Carvel Channel, which we have before mentioned, is used by vessels of a great draught of water, but as it does not shorten the route to the Harbor of Trinity, or the other anchorages on the east coast, and as there are great inequalities in the soundings, and the violent currents oftentimes cause a heavy sea, it is but rarely used. The least soundings we ever found there are 40 feet.

Trinity, next to Saint Pierres and Fort Royal, is the most commercial place in the colony. The city extends along a beach of sand which terminates to the north at Fort Point. Its length is about 3400 feet, its breadth is very small. Since the hurricanes of 1813 and 1817, there is no remarkable edifice. The River Epinette crosses it towards the southern part, after having watered a narrow valley planted with sugar canes. It is a watering place which may answer for vessels anchored in the road; but to have pure and limpid water, it is necessary to go to the interior a considerable distance. During our stay at Trinity, the crew of the Eclair preferred procuring their water at a spring at the plantation of Beau Sejour.

PORT ROYAL to ST. PIERRE.—The N. W. point of the Port Royal Harbor is low, though bold, and has a masked battery on it. To the N. W. of this point, about 2 miles distant, there is a rivulet of fresh water, and a village called Case des Navires, off which there is excellent anchorage, from abreast of its westernmost houses to abreast of a battery east of it. The anchoring-ground, or bank, reaches only to the distance of a cable's length and a half from the shore. Within half a cable's length of the beach, the water is shoal, deepening thence to three fathoms on the outer part, and to 5, 7, 10, 15, 18, and 25 fathoms, at a cable's length distance: off the battery the ground is clean, softening to soft mud abreast of the westernmost houses. Without the depth of 24 fathoms, the ground is hard and gravelly.

In order to anchor in this road, you must turn to windward before you stand in, until the easternmost cluster of houses in the village appears on with the middle of the valley behind them; then steer in with this mark. When the point between Case des Navires and the next village, called Case Pilote, opens without the land to the N. W., you will be entering on the bank in 43 fathoms: then steer so as to have the westernmost house of the cluster above mentioned on with the middle of the valley; and with Le Grosse Pointe, on the south side of Port Royal Harbor, shut in behind Point Negro, you may anchor a large ship in 18 or 20 fathoms. Small vessels may stand farther in, with the same mark, to the depth of 9 or 7 fathoms.

ST. PIERRE, (St. Peter,) the trading town of Martinique, lies about 4 leagues to the N. W. of Port Royal. It is built partly upon the rising grounds at the foot of a ridge of hills, and partly along the shore of a spacious circular bay, which forms an open road to the southward and westward.

The best anchoring place, called the Frigate's Anchorage, lies in the southernmost part of the road, (when you see some steep cliffs and rocks,) in 7 fathoms, gravelly ground. If you bring the highest steeple of the town N. $\frac{3}{4}$ E., and Point Carbet (on the south side of the road) south, you will have 7 fathoms, oozy ground.

The French frigate La Flore, being moored in this road, in 1772, with one anchor in 25 fathoms, fine sand, and the other in $4\frac{1}{2}$ fathoms, same ground, had the following bearings by compass, the variation at the same time, was 3° 52′ E.

Point Precheur N. W. by N. 3° N., the Galley's End N. 9° W., the Black Friar's Tower N. 3° W., the Negroes' Chapel E. 2° N., Point Carbet S. 4° W.

If you intend to stay some time in this road, it is proper you should lie with one anchor close to the shore, to the S. E. or E. N. E., (or even on shore,) and the other to the N. W.

In the hurricane months, that is, from the 15th of July to the 15th of October, ships cannot lie with safety in this road, and the French ships are generally obliged to leave it on the 15th of July at farthest. If they are to remain for a longer time at Martinique they retire into Port Royal Bay, where they lie secure against the hurricanes; they may also find shelter in Trinity Bay to the windward, and on the north side of the island.

Mr. Backhouse, in his description of the Road of St. Pierre, has observed that "there are 30 and 40 fathoms at two cables' length from the shore; but farther off than that you will be off the bank. They generally lay one anchor in 25 or 30 fathoms, and the other in 12. The marks with which we anchored were the fort S. by E.; the great church N. off shore one cable's length, in 24 fathoms.

In sailing from Case Navires to St. Pierre, you will pass the village and battery of Case Pilote, and those of Fort Capet and Carbet. Between the latter is the promontory called Morne aux Bœufs, which bears N. N. W. $\frac{1}{4}$ W., distant $5\frac{1}{2}$ leagues, nearly, from the Diamond Rock.

The anchorage in this bay is far from offering adequate security to the many vessels that frequent it from Europe, West Indies, the United States and Gulf of Mexico. Its being exposed to all winds from S. S. W. to N. W. by W., renders it particularly dangerous during the winter months, as well as towards the commencement and at the end of that season, by reason of the sudden squalls of wind then frequent. The ground

swell is then often experienced with a violence that afterwards causes great damage. In the other parts of the year, the road of St. Peter's is almost entirely exempt from those dangers, and it is a shelter from the reigning winds, which blow from the E. to the E. N. E., and the phenomenon of the grand swell is much nearer and less dangerous; the only inconvenience it occasions is to impede considerably the communications with the city, and sometimes to render them impracticable.

Vessels surprised at the anchorage by strong winds from the open sea, or from a heavy ground swell, find themselves in a critical situation. If they cannot tow out, or beat out, they are oftentimes thrown ashore by the enormous surges; if instead attempting to go to sea they remain at anchor, their loss is almost certain, particularly if they have not chain cables: for the continual shocks of the sea cause them to drag their anchors, or if they hold, the agitation of the sea causes the cables to part, and in either case they drive on shore and soon go to pieces. With the intention of preventing such shipwrecks, the colonial government orders all French vessels to quit the road of St. Peter at the commencement of the winter, and obliges them to depart for Europe, or pass this season in the bay of Fort Royal, either at the careenage or at the port of the Three Islets.

The best anchorage in St. Peter's Road extends from Point St. Martha to the south extremity of Thurin's Bay. The soundings in this part have less declivity than in the other part of the road. They form relative to the depth which exists before the city a flat space of less depth, called the Plateau of Carbet. You may anchor on this plateau in 21 fathoms, two cables' length from the shore, but you must not anchor farther off, particularly if you are west of a little ravine where the steepness in the rocks, round the Bay of Thurin is interrupted, as at this place we found 150 to 180 feet water, and a bottom of irregular rocks, on which many anchors have been lost.

The anchorage for merchantmen extends from Point St. Martha to the river des Peres, which bounds the city to the north. French vessels occupy the space south of the Place Bertin, and foreign vessels north of this place. In these two parts of the road the soundings having a very rapid increase towards the sea, you are obliged to come to anchor at a cable and a half's length from the shore, and to moor by the head to an anchor carried on shore. It is important to bury your anchors very deep in the sand, that they may resist the violent shock to which vessels are exposed from the ground swell. It is also necessary to take the precaution to have your cables tight, to prevent your vessel changing her position, and avoid falling on board other vessels.

A little distant from the Place Bertin, W. N. W. from the marine hospital, and at a cable's length distance from the shore, is a bottom of rock called Hospital Key, and on which foreign vessels are obliged to anchor. Its breadth gradually diminishes in approaching the shore, but on the western side it terminates abruptly by an almost perpendicular wall, so that from 50 to 96 feet, the soundings found off the key, you suddenly have from 166 feet to 213 feet, which are immediately outside its western limits. It is necessary to sound before anchoring on this key, and let go your anchor in 50 feet water, as in going farther off, at a cable and a half's length for example, you expose your cables to be cut by the rocks which form the limits of this key.

North of this key, and in approaching it from the river Des Peres, the anchorage becomes more and more difficult, by reason of the declivity of the soundings. At less than 2½ cables' length from the mouth of this river, the depth is 550 feet, and farther off you will find no bottom with 600 feet.

Variation at Fort Royal Bay, 1824, 2° 47′ N. E.

NORTH-EASTERN SIDE OF THE ISLAND TO ST. PIERRE.—Ships advancing from the eastward, off the north side of Martinique, generally take their departure from La Carvaelle, or the Carvel, a remarkable rocky islet, lying about 1½ mile off the N. E. point. In running thence along the coast, you must cautiously avoid the effect of flurries, or sudden and partial gusts of wind, which frequently proceed from the narrow openings of the mountains; and if the top-gallants are up you must keep a good lookout after the halliards. For it is to be observed, generally, that the mountains intercept the course of the trade wind, and consequently occasion calms and variable winds to leeward.

This side of the island is well cultivated. You will distinguish the plantations to the very summit of the hills, which are themselves covered with trees and grass, excepting only the Mont Pelee, or Bald Mountain, the highest of those hills, and the only one that is barren.

Point Macouba, the northernmost point of the island, is distinguished by a waterfall, or kind of torrent, falling into the sea from the top of a high rocky coast About five miles to the W. S. W. from Point Macouba lies a round rock detached from the land, called the Pearl, to the southward of which are the little islets called those of Precheur, or Preacher. Next follows the point of the same name. Soon after Point Precheur presents itself, which ends in a flat hummock, with a plantation on it, then the town of Le Precheur. Beyond Precheur Point, you will discern two others, in a line, namely,

the Morne aux Bœufs, before mentioned, to the southward of the road of St. Pierre, and the Diamond Rock, to the southward of Port Royal.

Between the north end of the island and St. Pierre, there are several villages, protected by batteries. The coast is very steep and clear of danger.

Having doubled Point Precheur, you will descry the ships which lie at anchor in the road of St. Pierre, as they all have awnings to protect them from the intense heat of the sun. You would take them at first sight for so many white houses, whose roofs are built like a terrace: you cannot come to anchor close hauled; for the winds, which always prevail from the E. and E. N. E., will compel you to traverse up to the road.

Remarks on the Navigation about Martinique, from the Derrotero de las Antillas, &c.

The land of this island is high and rocky, and may be discerned at about 15 leagues off. Its eastern part is full of bays, but they afford little shelter, and are frequented by coasters only. From the South Point, or Point Salines, along the western coast, to the North Point, Point Macouba, you may approach within a mile of the coast without any danger.

The principal anchorages of Martinique are those of Port Royal and St. Pierre. That of St. Pierre is an open roadstead, which affords shelter from the general breezes only; and vessels that are obliged to remain in Martinique during the hurricane season, go to Port Royal to pass it over. The fortress, called Port Royal, is on a tongue of land, which runs nearly half a mile to the south into the sea; from the S. W. part of this tongue, a shoal of sand and rock stretches out, but it may easily be discovered by the color of the water. By the eastern side of this point is the harbor and arsenal, where vessels anchor in the greatest safety; but they enter into it only in the season of hurricanes, or for the purpose of careening; its bottom is excellent, with a depth of from 6 to 10 fathoms. The city is about one-fourth of a mile to the north of this point, and at the sea side, on the west part, in Flamingo Bay, which is, therefore, the anchorage for merchant vessels; and, indeed, generally, for all vessels which are not to remain long at Martinique.

If you approach Martinique on the north side, and mean to anchor in the road of St. Pierre, you may haul in as close as you choose for Macouba Point, and should run along the coast afterwards so as to pass outside of the Islets du Seron, which lie on the N. W. point of the island; and from these you may shave the Point du Precheur (Preacher's Point) within half a cable's length, in order to run and anchor in front of the town of St. Pierre, or a little to the south of it; keeping in mind that the coast is so steep, that half a cable's length from it you will have 4 or 5 fathoms water, and 35 or 40 fathoms at 3 cables' length. Vessels moor with two anchors, one to the west in 35 or 40 fathoms, and one to the east in 4 or 5 fathoms; it is, however, better to have a cable on shore in place of the anchor to the east, that you may not drag with the strong gusts of wind which come over the land.

If you are bound to Port Royal, you will steer from Pointe Precheur to Morne aux Bœufs, which is the south point of the Bay of St. Pierre: and from it you will sweep along the coast to shave Point des Negres, (Negro Point,) from which you must haul to wind all you can, in the understanding that, from the said point to Flamingo Bay, you may shave the coast without any risk.

As it is necessary to beat up from Negres Point to the anchorage, keep in mind that the shoal which runs out from Port Royal Point, extends to the west as far as the meridian of a brook which runs into the sea, to the westward of the city: and thus, when you mark the said brook at north, you must not prolong the south tack further than to bring Port Royal Point a little to the northward of east, but ought rather to go about before you bring it to bear east, and anchor on the other tack, opposite the city. If you have to enter the harbor, it is advisable to take a pilot.

Those approaching Martinique from the southward, must steer so as to pass close to the Diamond Rock and Point, and shave Cape Solomon, where the course is nearly north, but nothing to the east of it, until Point Noire bears east; from this situation you will haul by the wind to take Flamingo Bay, or enter into the harbor as may be requisite, it being well understood that you can anchor in any part of the great bay.

If coming from the south, and bound to St. Pierre, you must steer from Solomon's Cape to Morne aux Bœufs, hauling in to anchor to the S. W. of the town, as already directed.

It is almost a matter of indifference what part of Martinique you make; only in case of the wind's being free from the N. E., you may consider it preferable to make the north side.

The strait between St. Lucia and Martinique is clear of all danger; the breeze is always steady in it, and its current is scarcely perceptible.

The Island of St. Lucia.

St. Lucia bearing N. W. by W. 3 or 4 leagues.

About a mile and a half to the west of the Sulphur Hill, on the sea shore, stand two high peaks, called by the French Les Pitons, and by the English the Sugar Loaves: they lie very near each other, but between them there is opening enough to distinguish both, on coming from the southward.

On the western side of the island, at the distance of about three leagues from its northern cape, is Port Castries, or the Careenage, one of the harbors in the Windward Islands, having deep water and good ground all over it. These careening places have been formed by nature, which require no wharfs, and only a capstan to turn the keel above ground. Thirty line-of-battle ships might lie securely here unmoored, during the hurricanes. No ships can enter without warping in; but there is always a breeze to carry them out: and in less than an hour, the largest squadron may be in the offing. The shores are so bold, that a first rate man-of-war may approach within six yards of them.

Nearly a league to the southward of the Careenage lies the Grand Cul de Sac, or Grand Bay: and nearly two leagues to the northward of the same, is the Bay of Gros Islet: these places form excellent roads for ships of war.

When bound from the northward to the Careenage, you will see a bluff two leagues to the leeward, which may be approached boldly; you must haul close in to see the harbor, then run into it as far as you can fetch, and warp in. When the sun shines all the dangers may be seen.

Should you have occasion to anchor off the south coast, you may do so in Old Fort Bay, (Anse de Vieux Fort,) under the S. E. bluff, unto which you may turn till you bring Point Moulacique, the southern point, to bear S. S. W., and then anchor in 7, 8, or 10 fathoms, good ground. At the north part of this bay there is a river, which runs into the sea. If you water here, it must be by proceeding half a mile up with the boat; unless after great rains, when you may fill at the entrance.

Remarks on St. Lucia.

[From the Derrotero, &c.]

The Island of Santa Lucia shows high, and in detached hills, with various peaks sufficiently visible: in particular, two, at its extreme S. W. part, called the Pitons, which may be seen at the distance of 16 leagues; they are black, and covered with wood.

At the N. W. point of this island there is an islet, named the Gros Islet, which is rather more than a mile distant from Point Salines, to the S. W. Between Salines Point and the Gros Islet, there is a rock named Burgaux. To the south of the islet is the Bay of Gros Islet, or Roadstead of St. Croix, with excellent anchorage for every class of vessels, having a depth of from 17 fathoms down to 5 fathoms, which are found at half a mile from the coast; between the coast and the Gros Islet there is a passage for small vessels only, it being impeded by a shoal, on which there are only 2 fathoms of water. The Gros Islet is foul, and you ought not to approach nearer to it than two cables' length.

Near Berlotte Point, to the south of Gros Islet Bay, there is an islet which forms a strait, practicable for any vessel, it having 7 fathoms of water in it. This islet is, like the Gros Islet, foul, and you must not approach nearer to it than 2 cables' length; the coast, on the contrary, is clean, and a rock, which is also clean, lies about a cable's length out from it. On all this coast there are from 8 to 10 fathoms, at half a mile from it, and you may anchor in any part, though the safest anchorage is in the road of St. Croix, where there is good shelter from the sea.

About a mile and a half to the S. by E. of Brelotte Point, there is a rocky shoal, extending nearly in that direction, which is a mile in length, and about two cables in breadth; its distance from the coast is more than half a mile. This is the only danger on all the western side of St. Lucia, on which there are excellent anchorages, but principally in the Careenage, which is two leagues to the S. by W. of the great islet, and the best harbor in the Lesser Antillas, with excellent anchorage, very clean, and three natural coves in the interior, and such steep shores that they might serve as wharves, or moles, at which the largest men-of-war may be hove down. This harbor has, however, the disadvantage

that you cannot enter it except by towing or warping, it being impossible to beat in, on account of its narrowness; but, in exchange, it is easy to get out of it, even with a large squadron; as you must enter either towing or warping, it is sufficient to say that the south point sends out a very shallow tongue of sand to the N. W., and that the north point is deep and clean, and you may approach within a quarter of a cable's length of it, without giving a berth to more than the rocks which are seen.

The strait between this island and St. Vincent's is subject to tornadoes, and strong currents to the W. N. W.; and as Port Castries and the Bay of St. Croix are towards the northern extremity of the island, it is advisable to make the land, when bound to them, from the northward.

The Island of St. Vincent's.

St. Vincent bearing S. by W., about 4 miles.

From Bequia to St. Vincent's, the course is north about two leagues. The channel between these two islands is very good to come through, if bound from Barbadoes to the Salt Tortuga, or the Spanish Main; and there are small trading vessels which work up through it. St. Vincent's is about five leagues long, and lies nearly N. and S. and E. and W. The north end, which is much higher than the south part, is inhabited by about 2000 natives, or Caribs. On the north end there is a volcano, called La Souffriere, or Sulphur Hill, near Spanish Point. On the west side of the island, which is bold, are several bays, having all of them fresh water rivers; and on the S. W. side you make good anchorage, as near or as far off as you please, especially in Kingston Bay, where the chief town is situated. But the best bay of the island is Balair Bay. When you turn up between St. Vincent's and Bequia, you will see a large bluff of land, and just to the windward of that is Balair Bay, or Calliaqua. The shore is bold on each side. Run into 19, 20, or 15 fathoms, and anchor. There are two rivers which run into the sea.

The course from Carlisle Bay to the south end of St. Vincent's is W., northerly, 33 leagues. If you intend to anchor in Kingston Bay, you will see a small high peaked island, called Young's Island; pass the bay to leeward of this island, and go round a long sloping point: you may borrow within pistol shot: but if the wind takes you short, you may anchor in 35 fathoms, and warp in. There is a small ledge of rocks close on the weather shore, within 6 fathoms.

On the west side of the island, which is bold, there are several bays, all of them having fresh water rivers; and on the S. W. side ships may anchor at pleasure, especially in Kingston Bay, on which the chief town of the island is situated.

The best bay, however, for shipping, is that called Calliaqua, or Tyrrell's Bay, at the south end of the island. This may be known by a high bluff, which will be seen when turning up between St. Vincent's and Bequia, which lies on the leeward side of the bay. The shore is here bold on each side. Run into 19, 20, or 15 fathoms, and anchor. There are two rivers, which run into the sea.

Kingston Bay is completely open to the S. W., and is more than a mile in breadth. The town is at the head of the bay, close to the water side; the anchorage good, the soundings regular, with a bottom of dark sand, apparently clear, and forming a good holding ground. The water is deep on each side of the bay, and you may round the eastern head, called the Old Woman's Point, as close as you please, there being 20 fathoms at not more than 200 feet from the shore. The best anchorage for a frigate is with the court-house bearing north, in 19 or 20 fathoms, not more than a quarter of a mile from the beach. There is a light current setting along the bay, but it is not regular. The tide rises about 4 feet. Fresh water is good, and easily obtained.

PRINCESS, or BARAWALLY BAY.—This little bay lies five and a half miles to the north-westward of Kingston, and its north side is formed by rocks, called the Bottle and Glass, between which and the main there is a passage for boats. There is no danger in going in; and, in coming from the northward, you may haul close round the Bottle and Glass. When round this point, luff up as much as possible, and you will open the town barracks, bearing N. E. by E. ½ E., which may be kept thus until the Bottle and Glass Point bears N. W.; you will then be in about 22 fathoms, with sandy ground.

All along the Bottle and Glass side is rocky, but the bottom of the bay all sandy and good ground. If you moor in and out, which is used for ships of war, you may warp in,

and lay your inner anchor in 12 or 13 fathoms of water, and your outer anchor will be in 32 fathoms. Moor a cable each way.

THE GRANADINES, or GRANADILLOS.—The Granadines form a chain of innumerable rocks and barren spots, good for little, which extend to N. E. by N., for about 16 or 18 leagues. Some, however, are of considerable size and value, particularly Cariuacou and Bequia, both inhabited, and producing good coffee and cotton. Cariuacou lies about 6 leagues N. by E. ½ E. from the N. W. of Grenada. It is of a circular form, of about 6 miles in length and breadth, and has a commodious harbor.

Bequia, called also Little Martinique, is the northernmost of the Granadines, and lies about 2 leagues south from St. Vincent's. On the west side it has a very good sandy bay, where you may ride occasionally; and wood is to be got there, with plenty of fish, but no water. The little islands to the southward of Bequia are very fair, and near them you may stand boldly, having neither rocks nor dangers you need to fear.

N. by E. course from Point Laurent, or the N. W. point of Grenada, will carry you clear along the Granadines.

Observe that towards the south part it is rather dangerous to come near in the night.

ISLAND OF GRENADA.—There is good anchoring ground along the coasts, and on the eastern and western sides are several small bays and creeks, commodious for vessels, as well as for the landing and shipping of goods.

The principal town is that of ST. GEORGE, in the S. W. quarter of the island, which is situated on a bay of the same name, formerly called La Grande Bay. This bay is formed by a point called Molenier's Point, on the north, and Cabrit, or Goat Point, on the south. The distance between these points is 3½ miles. The space between is not entirely clear, as a coral reef extends out to a considerable distance from Point St. Eloi, which lies a mile to the south-eastward of Molenier's Point; and there is a sand bank, of only 17 or 18 feet of water, on which coral is beginning to grow, at some little distance off the fort point, on the north side of the entrance to the harbor.

The chief bay on the eastern side of the island, is that called Greenville Bay, which is open and protected by extensive reefs.

The town of GREENVILLE is a port of entry, having its distinct custom-house establishment. The villages are generally on the shipping bays around the island.

On the south side of the island, immediately on the western side of the Point of Fort Jeudy, and 2 leagues to the eastward of Salines Point, lies the harbor called Calavine, or Egmont Harbor, which is very deep, and where, it is said, sixty men-of-war could ride in safety without anchors. The entrance is nearly half a mile in breadth. Within, its peculiar conformation is such, that it may be considered as forming two harbors, namely, the Outer and Inner Ports. The entrance into the latter is narrow, and its length rather more than half a mile. The depth in the greater part is 7 fathoms, with excellent holding ground, being every where a soft oozy bottom. The ships may here lie alongside of the warehouses, and take in their lading with great ease and convenience; after which they may, with very little trouble, be towed into the outer harbor, which enjoys this peculiar advantage, that ships can sail in or out with the common trade wind.

In sailing off the south side of the island, there is little danger until you get to the westward of Fort Jeudy Point. But thence to the rocks named the Grampuses, it is necessary to keep a good offing, as the ground in-shore is very foul, and full of reefs. The Grampuses lie about three-quarters of a mile off the land, with the point called Pirogue Point bearing N. ½ W. They appear just above the surface, and there is a passage within them, but it is not deemed safe.

Off the north side of the island, in the channel between it and Redonda, or Round Island, there stands a remarkable rock, called London Bridge, (from its having a natural arch in it,) and from the south side of which extends a reef. This rock may be easily avoided by keeping over to the north side of the channel. Hence, and along the west coast of the island, the shore is bold, all along to the point of St. Eloi, whence a coral reef extends, as before explained.

Islets off the North end of Grenada.

ST. GEORGE'S BAY.—When sailing into St. George's Bay, from the northward, give Molenier's Point a small berth. You may run within half a cable's length of it, in 8 or 9 fathoms. The point is low, with some straggling trees on it, and makes like an island. When near the point you will see St. George's Fort bearing S. S. E. Keep your luff for the fort, and when you cannot fetch near enough to anchor, with the fort bearing east, tack, or you will be in danger of running on the Three-Fathom Bank, before

noticed. The soundings are very regular from Molenier's Point—some casts 20, 13, 9, and 12 fathoms; and in-shore, towards the fort, from 9 to 5 fathoms: the bottom is foul.

To sail within the Three-Fathom Bank, or Middle Ground, you may be directed by two white houses, over the town, about half way up the hill. Keep them open with the north end of the fort, and run directly in, until you see a single tree to the southward, upon a little hill, open a good sail's breadth to the northward of a large tree close to the shore; you will then be within the bank, and may pass the fort point at the distance of half a cable's length, in 4 and 5 fathoms. In the mouth of the harbor there are 15 fathoms of water, but it shoalens very fast to the southward.

The best anchoring ground in St. George's Bay is off the mouth of the harbor, at about a cable's length from the fort, with the two white houses, above mentioned, open to the southward of the fort; but, if you anchor in the bay off the town, the houses must be open to the northward of the fort, and bear E. S. E.

In advancing towards St. George's Harbor from the southward, it must be observed that after passing Point de Salines, there is a very dangerous coral reef lying between that point and Goat Point, with only 2 or 3 feet over it in the shoalest part. This bank lies with the signal staff of Fort St. George in one with a house that has two little turrets, or pavilions, situated on the top of a hill a little to the eastward of the redoubts on Hospital Hill. With this mark, you will be in a line with the reef, and must give it an offing. The bank is about a mile in length, lying parallel with the shore. Within it there is a narrow channel, through which small craft frequently pass.

In running from the eastward towards Point de Salines, you will see Islet Rameur, a very small island, lying rather more than half a mile from the nearest shore, and nearly a mile from the point. Give that islet a berth of a mile, and do not attempt to pass within it, as the passage is shoal. To Point de Salines it is sufficient to give a berth of half a mile, as at that distance there are 7 fathoms water. So soon as you pass the point, the bay will be open. You must now carefully avoid the bank above described, which you will have passed, when a remarkable house, like a summer house, upon a high point close to the end of the reef, bears S. E. On the bank the sea frequently breaks.

To sail into the harbor you leave the Three-Fathom Shoal, as before directed, on the starboard hand, and run in close under the fort, and then warp up. The ground is all clear, and the harbor capable of containing, with the utmost safety, a large fleet of ships of the line.

You will generally be obliged to work up into the bay, as it lies open to the westward, and the trade wind blows directly outward. The true entrance of the port is from W. S. W.

GREENVILLE BAY.—This port lies about half way down the island, on the eastern side, and all those bound for it must be very cautious, and not go to leeward of it; for, if they do, they must pass round Point de Salines, and turn to windward, on the other side of the island, as the current sets so strongly to the southward that, with the prevailing winds, the fastest sailing vessel cannot lead up. They should heave to a little to windward of the Greenville Rock, which lies to the north-eastward, (off Telescope Point,) and is round, pretty high, and steep on all sides. Upon firing a signal, a pilot will come off, and take charge of the ship.

The marks for going in are two white beacons, formed at the head in shape of a diamond. One stands at the head of the bay, and south end of the town, at high water mark; the other a little inland, on the side of the road leading over the mountains. They bear, when in a line, N. 74° W. By keeping them thus you may run directly in, under an easy sail. Be careful to steer very small, as the channel between the rocks is very narrow, not being a ship's length across. After you are through the narrow, if your ship draws more than 13 feet, you must come too at the mooring chain, and lighten.

This harbor, to those acquainted with it, is safe and commodious, being sheltered from all winds. Yet it is impracticable to a stranger, the lead being no guide; and, if you once get too near the rocks, the current sets so strongly that you cannot get off again.

Remarks on Grenada.

[From the Derrotero de las Antillas, &c.]

Any part of Grenada may be safely approached to within less than two miles. On its western coast are many bays fit for anchoring in, but the principal is that in which stands the town and harbor of ST. GEORGE, or Port Royal. This bay is about one league from the Salines, or the S. W. point. Between that point and Fort St. George, there is a rocky shoal and banks of sand, with coral. The rocky shoal is half a mile in extent from N. E. to S. W., and its greatest breadth is two cables' length. On all its edges there are 6 and 7 fathoms. It bears N. 25° E., true, three-quarters of a mile distant from Point de Salines, and the northernmost part of it lies nearly W., or W. by N., from Goat Point, at about three cables' length. Goat Point is the southernmost point of St.

George's Bay. The first sand bank is a mile in extent, N. by E. and S. by W., and its greatest breadth is three cables' length. The least water on it is 3¼ fathoms, and close to it are 6½ and 7 fathoms. Between it and the coast the depth increases to 10 fathoms. The western extremity lies nearly north from Goat Point, and at the distance of half a mile. The second bank, on which there are not more than 3 fathoms of water, lies S. 59° W., true, from the fort, at the distance of half a mile. The greatest extent of this bank is three cables' length.

Behind the point on which the fort stands is the harbor, which is only three cables' length in depth, and into which vessels go to load and unload, or to be careened. This place is as well sheltered as the best harbor can be, and vessels of the greatest burthen can haul alongside the shore, in a depth of 8 or 10 fathoms.

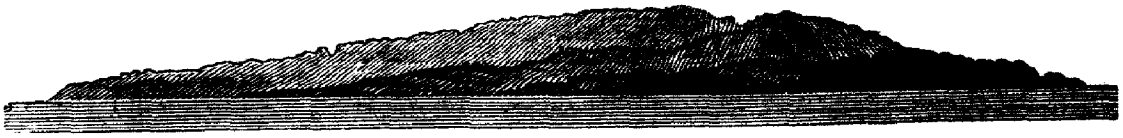
Grenada may be seen at the distance of 7 or 8 leagues; and, as the principal harbor is by the S. W. point, the best way is to make and haul in for its south side.

To the south of Point Pirogue, on the south coast, there are some rocks even with the water's surface, which are called the Grampuses, and which lie out about two-thirds of a mile from the point. At night it is necessary to be certain how you run, that you may keep clear of them. To the westward of Pirogue Point, nearly half a league, there is an islet named Glover's Island, which is very clean, and has 4½ fathoms of water, at a cable's length from it. To take St. George's Bay, you ought to pass about a mile without Glover's Island, and at half a mile with Point de Salines, steering to the north so soon as you have passed the latter, until Goat Point bears east; then luff to the eastward, and place the prow to Point St. Eloi, which is about a mile to the northward of the Fort St. George. Thus you will pass safely outside of the shoals. So soon as the point on which the fort stands bears east, you will have passed the last shoal, and may beat up between it and Point St. Eloi, taking care neither to prolong the tacks to the south of the fort, nor within less than two cables' length of St. Eloi's Point, which sends out some rocks to the west.

The anchorage is to the west of the town, at a quarter of a mile from the coast, where you may let go an anchor in 6 or 9 fathoms. The bottom is very various, for you may equally find clay, sand, or rocks. Vessels intending to make a short stay only, bring to in this place, with only one anchor; but those which have to make a stay and unload, go into the harbor, where they moor with four.

Some charts depict a bank and shoal to the S. W. of Point de Salines, with 13 and 45 fathoms. In the strait between Grenada and Tobago, the water has been found to set S. 70° W., with the velocity of a mile and a half an hour.

The Island of Barbadoes.



Barbadoes bearing W. N. W., about 6 leagues.

Barbadoes, which lies out of the line, and to windward of the Caribbee Islands, is of moderate height, and generally level, although there are a few hills, of easy ascent. The island may be seen, in fine clear weather, 10 or 11 leagues off. The east end is much lower than the other parts; but, on coming from the eastward, or when the north end of the island bears W. by N., and the S. W. point about W. S. W., then the eastern part appears the highest. From the eastern part to the southward the land is even, and declines towards the sea; but, between the eastern and northern points, it is uneven, rugged, and broken.

The S. E. coast, from South Point to Kitriages on the eastern point, is enclosed by a ledge of rocks, called the cobblers, from one of the most remarkable among them. They extend about a mile from shore, and you must be careful to avoid them in the night. At South Point, where the rocks terminate, there is a flat spit, which must have a berth, as it runs off above a mile to the W. S. W. In the day time you may see how far it extends by the white water.

The principal town of Barbadoes is that called Bridgetown, situated at the mouth of a little rivulet on the north side of Carlise Bay, upon the S. W. side of the island.

Those bound to Bridgetown should always endeavor to make the south side of the island, by sailing on or near the parallel of 13°. In the latitude of Barbadoes, at about 70 or 80 leagues to the eastward, you will find the water discolored and thick, as if there were soundings, though there are none; by this indication, if met with, your situation will ne nearly ascertained. When you approach the island, you may run along within three miles of the shore, until you advance towards Needham's Point, which forms the

south side of Carlisle Bay. You may haul up and anchor in Osten's Bay, to the westward of South Point, by avoiding the spit above described, where you will find ground in 7, 8, 9, or 10 fathoms water. This bay is rocky; but the best ground, which is tolerably good, lies with a mill close by the water side, at the head of the bay, bearing E. by N., or E. N. E.

In Carlisle Bay, also, the ground is foul, and apt to chafe the cables. In hauling in for this place give Needham's Point a berth of a quarter of a mile, to avoid a reef which stretches from it, and always breaks. You may then run in till you bring Charles Fort, on Needham's Point, to bear S. E., and the steeple N. N. E.

There is, also, anchorage in this bay, in 25 fathoms, fine sandy bottom, with Needham's Point S. E. ½ S., the church N. N. E., and the N. W. point of the bay N. W. by N.

The long mark for the reef of Needham's Point is a house standing upon the hill above the north end of the town, open with the outermost or southernmost flag-staff on Needham's Point; and the thwart-mark is the three flag-staffs in one. With the above mentioned house on the hill open to the northward of the church, the ground is foul, but to the southward it is more clear: and with the house just open to the southward of the church, there is an anchorage in about 12 fathoms; the other marks for which are, a road to the eastward of the town directly open, the fort S. S. E. ½ E., and Pelican Point N. W. by N. The tide is almost imperceptible.

On the leeward side of the island, N. N. W. from the northern part of Carlisle Bay, are several shoals, called the Pelican and Half Acre Shoals, the outermost of which lie about three-quarters of a mile off.

Before Speightstown, which lies between eight and nine miles to the northward of Bridgetown, and which is defended by three forts, vessels occasionally ride.

There is a bank lying about three hundred miles to windward of Barbadoes, called Glassionieres, from the name of the French Admiral who first reported it, but subsequent information confirms it.

TOBAGO, like Barbadoes, lies out of the line, and to windward of the Caribbee Islands. The land in the northern part is so high as to be seen, in clear weather, at the distance of fifteen leagues.

Though Tobago does not possess any harbors, properly so called, yet it has several good bays; which, considering that from their southern latitude they are never exposed to dangerous gales of wind, are equally convenient and secure to shipping. For this reason, the men-of-war stationed at the Caribbee Islands, frequently repair hither for safety in the hurricane months.

The principal towns are Scarborough and Georgetown, situated on the south side of the island, and its roadstead is in Man-of-war Bay, on the north side. The vertical rise of the tide, on the full and change, is only four feet. The currents near the island, are very strong and uncertain, especially between it and Trinidad. The N. E. trade wind prevails all the year round.

The course usually taken from the island of Barbadoes to the S. E. side of Tobago, is south rather easterly, so as to allow for the current, which sets most frequently to the N. W., and so as to get several leagues to windward of the island.

If you make Tobago towards the evening, and are afraid of running in with it, you must not, by any means, lie to, but stand to the southward under an easy sail, otherwise the current, which always sets either to the N. W. or N. E., may occasion your losing sight of the island; and it is possible that a N. W. current may carry you so far to leeward as to render it difficult to regain it.

Ships bound to the bays on the N. W. side, should always endeavor to make the north end of the island, which is bold and clear. A cluster of large bold rocks, called Melville's Rocks, lies off the N. E. point. Of these the westernmost is very remarkable, having a large hole in it, from north to south. You may run as near to these rocks as you choose, and along the coast hence to the Man-of-war Bay.

MAN-OF-WAR BAY.—This bay is not only the best in Tobago, but is one of the best harbors in the West Indies, having sufficient depth for the largest ships close to the shore. The distance from Melville's Rocks to North Point, on the N. E. side of this bay, is about three miles. In sailing in, haul round this point, when you will have the bay open, and you must be careful not to be taken aback, the wind being very fluttering under the high land.

You will find no soundings until close up in the bay, and then from 40 to 10 fathoms.

Having entered, turn in and anchor as far to windward as you can. After you are shut in, you will see the little bay on the eastern side, called Pirate's Bay; get as near to that bay as you can: you will find all clear ground, and may anchor in from 12 to 14, 16 or 17 fathoms. If you cannot turn in, you may anchor in 35 or 40 fathoms, and warp up. In Pirate's Bay, is the watering place in the rainy season.

On the south shore of the bay you may anchor in 16 or 18 fathoms, at a quarter of a mile from shore, and have good water at all times, half a mile from the anchorage: but there is a great surf, which makes watering hazardous.

The western side of the bay is a good place for fishing; but there is a small shoal called the Cardinal, lying within half a mile of the shore, on that side, about half-way down the bay.

Nearly two miles to the westward of Point Corvo, the western point of Man-of-war Bay, are some bold rocks, called the Brothers; and in the same direction, at a league and a half from that point, are some others of the same description, called the Sisters, close to which there is a depth of 40 fathoms. All the coast hereabout is bold to. From abreast of the rocks, the south-west end of the island, which is low and sandy, may be seen.

COURTLAND BAYS.—The first bay from the northward, on the western side of the island, excepting a few for small vessels, is that called Great Courtland Bay, the northern point of which, called Guana Point, lies thirteen miles to the south-westward of the Sisters. To this point a berth must be given, as a rock, called the Beef Barrel, which breaks at low water, lies just off it. There is anchorage in 6 fathoms, but good fishing in 9 or 10 fathoms, either with the seine or with the hook and line. The ground is clear, only that there are a few stumps of trees close up to the mouth of the river. If the wind hangs to the southward of east, you will ride very roughly, and if at N. E., will roll very much. In the bay you will have the common trade wind all day, and an off-shore breeze during night. If you arrive in the night, and do not care to push for the bay, you may find very good anchorage to windward of the cliff, in from six to twenty fathoms, regular soundings.

To the southward of Great Courtland Bay is Little Courtland Bay, having very good anchorage within the windward point, which is pretty bold. Vessels ride more safe and smoothly here than in the former.

Between Man-of-war Bay and Courtland Bay, are the bays called Bloody Bay, Pealetuvier's Bay, Englishman's Bay, and Castana Bay, which have safe anchorage for vessels of one hundred and fifty tons.

At the S. W. end of Tobago is Sandy Point Bay, in the bottom of which ships may anchor in 6 fathoms. When you weigh for this place, be sure of a breeze to carry you without the reef, called the Buckoo, which extends from Little Courtland Bay to Brown's Point, and is dry in some places, at the distance of two miles from shore. If it be calm the current may set you on this reef. At the distance of two cables' length from the breakers you will be safe to enter Brown's Point Bay; haul close round the reef, and having passed the point, anchor as above.

EASTERN COAST.—About three and a half miles S. S. E. from Melville's Rocks, lies the small island called Little Tobago, near which there are several islets and rocks. Within these is the bay called Tyrrel's Bay, in the bottom of which vessels of 150 tons may anchor in 7 fathoms. The ground between Little Tobago and the main, is very foul, and the currents very strong and uncertain. In sailing off this part of the coast, ships must, therefore, keep well to the southward, allowing for a N. W. current, which almost constantly prevails about Little Tobago.

At the distance of three and a half miles to the southward of Little Tobago, is Pedro Point, and rather less than two miles from Pedro Point lies a high rocky islet, called Queen's Island. Between these points is the bay called King's Bay, which has good anchoring ground in every part within the windward point, in from 6 to 20 fathoms of water. The land on the eastern side, being high, intercepts the trade wind, and the swell from the eastward is apt to set a vessel down to the leeward point; the best time to sail out is early in the morning, about daybreak, when the wind blows fresh from the land on the northward.

South-westward from Queen's Island, at the distance of a league, lies a similar islet, called Richmond Island; and one league and a half from the latter, in the same direction, is a lesser islet called Smith's Island. These islets, being situated off projecting points of the coast, are conspicuous. Nearly a mile west of Queen's Island is a large dry rock, called the Roxburg, and between lies the bay, named Queen's Bay. Between the Roxburg Rock and Richmond Island, is Hog Bay, in which the ground is foul. To the N. W. of Richmond Island is the little bay called Halifax Bay, which is noticed hereafter. From Halifax Bay, extending nearly to Smith's Island, there is a dangerous bank and reef, half a league broad, called the Great River Shoal, on which the depth, in several places, is only three fathoms.

In running down for Queen's Bay, which lies within Queen's Island, as above mentioned, give the latter a good berth until you open a large house, having a gallery on a rising ground fronting the quay, which is the only one of that description in the bay. Continue on this, without borrowing, until you bring this house in a line with one on the hill above; and keep this mark on, if the wind permits, until you are 2 cables' length from the shore; then haul your wind and anchor about 150 fathoms from shore, in 5 fathoms, fine ground, abreast of the watch-house on the beach. Should the wind be adverse, you must let go an anchor and warp up. In sailing outward, attend to the same mark as in sailing in, without getting over to windward.

The dangers are so numerous, from Queen's Bay to the west end of the island, that

no stranger should venture without a pilot. The most accessible bays are those described as follow:

Halifax Bay, to the N. W. of Richmond Island, as before mentioned, is a good bay for vessels of 150 tons, but a shoal lies in the middle of the entrance. The next is called Barbadoes Bay, and lies to the leeward of Smith's Island. To avoid Great River Shoal, in sailing for Barbadoes Bay, or to the westward of it, keep little Tobago open without Richmond Island, with Smith's Island bearing N. W., you may luff up for the bay, on cautiously avoiding a reef of coral rocks, which stretches to the distance of a cable's length from Granby Fort Point, on the windward side. Within this reef, before Georgetown, there is good ground, in from 12 to 7 fathoms; particularly with a silk cotton-tree on the beach in a line with the flag-staff on the top of the hill.

Rocky Bay, on which the town of Scarborough is situated, is a deep bay, generally safe; but a heavy swell rolls in with the breeze, especially when it is to the south of east. It lies five and a half miles to the westward of Barbadoes Bay. In sailing towards this place, keep Little Tobago open of Richmond Island, as above directed, to avoid Great River Shoal; and next observe that the Chesterfield Rock is a danger which must, also, be cautiously avoided. This is a sunken rock, having only 7 feet over it, and on which the sea frequently breaks. It lies at half a mile from shore, about two and a half miles to the southward of Granby Fort Point, and at the same distance to windward of the east side of Rocky Bay. You may sail clear within it, with Richmond Island open between Smith's Island and the main; and without it, by keeping Richmond Island open without Smith's Island: for, Richmond and Smith's Islands in a line, lead directly on it.

When past the Chesterfield Rock, you haul in for Scarborough Point, which is a bold bluff point, with a fort on the hill. There is no danger, provided you keep the weather shore well on board, till you open the main street, which extends directly up the hill. With this mark you may anchor in from 7 to 9 fathoms, being the only clear part of the bay. It is requisite, even here, to buoy up the cables. No stranger should attempt to leave the harbor without a pilot, as it would be extremely hazardous. The channel between Scarborough Point and the reefs is less than three-quarters of a mile in breadth, and the dangers extend thence to the end of the island.

In the channel, between Tobago and Trinidad, is a bank, or shoal, on which 5½ fathoms have been found, and the pilots assert that there are places on it with still less water; it has been sounded with great care, but less than 5½ fathoms have not been found. It is, however, advisable to run with caution; for it is not impossible that there may be some rock, of small extent, which has escaped notice. In this channel, or strait, the current runs to the westward at the rate of two miles per hour; but, so that when approaching Trinidad, the direction of the current is towards the N. W., and near Tobago, towards the S. W. On the N. E. part of Tobago the current sets to the north-westward with more velocity than is stated above.

THE ISLAND OF TRINIDAD AND GULF OF PARIA.

Compiled chiefly from the Directions and Survey of Captain Columbine.

All the bearings given, whether points or degrees, are true bearings, unless otherwise expressed.

THE ISLAND OF TRINIDAD is of considerable magnitude, containing, according to computation, 2012 square British statute miles. It presents a front to the eastward of nearly 42 geographic miles. from Point Galere to Point Galeota, its N. E. and S. E. extremes; the latter bearing from the former S. 7½° W. From Point Galeota the South Coast extends 56 miles westward to Point Icaque, or Icacos; and from the latter to Mona Point, which is the N. W. extremity of the island, it is 43 miles in a N. N. E. direction. The North Coast extends eastward from Mona Point, about 46 miles, to that of Galere. A range of high mountains extends all along the North Coast, which may be seen at the distance of 11 or 12 leagues; and these stretch to the southward above 3 leagues on the East Coast. The south side is also bordered by a range of mountains, but considerably inferior in height to those on the north side; and near the middle of the East Coast is another range, extending to the W. S. W. The other parts of the island are principally low and level land, with some savannas.

GULF OF PARIA.—Between the Island of Trinidad and the main land, there is a large space, or opening, called the Gulf of Paria, affording secure shelter to ships of all classes; as they may anchor in any part of it without the smallest risk, and in any convenient depth of water. This great Gulf may be entered by two channels, one to the north, the other to the south: that to the north is divided into several small channels by

some islands; and that to the south has an islet in it surrounded by rocky shoals, which are dangerous.

NORTH COAST OF TRINIDAD.—From Point Galere, the North Coast of Trinidad stretches first S. 85½° W., 29 miles, to Point Chupara, and thence S. 76° W., 14½ miles, to Point Corozal; whence it bends to S. 58½° W., about 4 miles, to Point Mona. All this coast is bounded by rocky shores; and, with the exception of a small part, with steep mountains, thickly covered with wood, close down to the sea, which breaks in a heavy surf along the whole extent, and renders landing impossible, except at very few places. The land immediately about Point Galere is not above 50 feet high; it rises towards the west, and about Toco begins to connect itself with the chain of mountains which extend along the whole north coast, from Rio Grande to the Bocas. Of these, that of Maraccas, called by the Spaniards Cerro de las Cuevas, is the highest, being 2947 feet above the surface of the sea, and not two miles from the sea coast: those to the eastward are estimated from 2000 to 2500 feet high, and those to the westward at less than 2000.

Between Mona Point, and that of Chupara, there are some bays; but so much swell sets into them, and the wind is so uncertain and light close to the shore, that it is dangerous to anchor a ship in any of them, except in Escouvas and Maraccas. Of these, the first from the westward is Macaripe, a cove in which there are from 7 to 3½ fathoms water, sheltered from the N. E. winds, and defended by two batteries: this lies about 3 miles to the eastward of Mona Point, and one mile to the westward of Point Corozal. The next is Chute d'Eau, at the distance of 5 miles to the eastward of Point Corozal; this is also a small sandy cove, deriving its name from some rills of water, which, as they descend from the hills, are projected over the rocks in various directions. Off the east point of this cove is an islet of the same name; and about 1¾ mile to the eastward of it is Isle aux Vaches, an islet lying close to the east point of another cove or bay, in which there is anchorage in from 12 to 8 fathoms, sheltered from N. N. E. winds. About E., 1¾ mile from Isle aux Vaches, is the west point of Maraccas Bay, having to the eastward of it a small bay, called Mal d'Estomac, in which there is no shelter; this point lies 9 miles to the eastward of Point Corozal.

MARACCAS BAY.—This bay is a mile wide, and about the same depth, having from 16 to 10 fathoms, on mud, at its entrance, decreasing gradually to 8 and 7 fathoms, on sand, near the middle. It is open to the north, but is capable of affording more shelter than any other on this part of the coast; the land about it is level for a considerable space. Two miles farther north-eastward is Escouvas Bay, five-sixths of a mile wide, and about half that in depth, with from 10 to 5 or 4 fathoms water in it. The east point of this bay, on which there is a battery to defend it, is 1⅔ mile S. W. from the west part of Point Chupara. Here is anchorage at about one-third of a mile from the east point, in 9 fathoms water, sand and mud, with the fort, (Abercrombie,) bearing E. N. E., and the large house on the south side of the bay S. by W. Escouvas is a better anchorage than Maraccas Bay; the latter, although much larger, being more subject to calms and sudden shiftings of the wind.

POINT CHUPARA.—Point Chupara is scarped and cliffy, and extends about a mile nearly east and west. At the distance of 700 feet to the westward of its west extremity, is a rock, on which the sea generally breaks; and the reef extends about half a mile eastward from its east extremity. From this point the coast inclines to the east south-eastward, being a sandy beach; and at the distance of three-quarters of a mile, is the entrance of the little river Chupara, fit only for boats. Here the coast again trends eastward; is partly composed of cliffs, and at the distance of 3⅛ miles is the mouth of the little river Macapou, similar to that of Chupara. Nearly 3 miles further, in the same direction, in the east part of a small sandy cove, is the little river Paria, of the same description as the former: a small islet lies off the east side of the cove, close to the shore, called Paria Islet: 2½ miles to the westward of this islet, and about one-third of a mile off from the rocky points on the east side of the River Macapou, there is a reef of rocks: there are also several other rocks lying at a short distance from shore, between Chupara and Paria, but none so far off as the reef just spoken of. About two miles eastward of Paria Islet is Trou Bouille Ris: the shore between being chiefly rocky cliffs, with two islets lying near it. Nearly 1⅔ mile farther, in the same direction, and at the east end of a sandy beach, is the mouth of the little river Mandamus, having between a projecting rocky point: this, like the former, will admit nothing but boats. Hence the coast trends to east north-eastward 3 miles, to Point Matelot, which lies 14 miles N. 87° E. from Point Chupara.

From Matelot Point to Rio Grande Point, the bearing and distance are N. 80° E., 7⅛ miles: at about a mile to the eastward of the former is Le Petit Matelot; and between these, close to the eastward of a rocky spot, is the entrance of Shark's River, similar to those already described. The coast thence, to within half a mile of Rio Grande, is chiefly rocky and high, with a few sandy bays. Rio Grande, contrary to its appellation, is a small river, like those before mentioned; it lies about S. W. by S., three-quarters of

a mile from the point of that name, the shore between being scarped: from the entrance of the river a sandy beach extends westward about half a mile, having off its west extremity two islets, or rocks, the outermost of which lies nearly one-third of a mile from shore. A vessel may anchor in 9 fathoms water at one-third or two-fifths of a mile W. by N. from Rio Grande Point, (off which is an islet or rock,) with the east end of the sandy beach bearing about S. by E. ¼ E. The coast from hence trends nearly E. 2¼ miles, to Point Sans Souci; the shore being chiefly scarped.

From Point Sans Souci to Reefs Point, (called by the Spaniards Toco Point,) the bearing and distance are S. 87° E., 4⅔ miles. Here the coast bends in a little to the southward, and is of the same description as the anterior. About E. by S., 2⅔ miles from Sans Souci Point is Toco Point, with some islets, or rocks, lying close to it; and between it and Reefs Point, to the west south-westward of the latter, is Toco Bay, where a ship may anchor at about three-quarters of a mile from the land, in 12 fathoms water, muddy ground, with Reefs Point bearing E. by S., Harris' house* S. S. E. ¼ E.; or farther southward, in 12 or 14 fathoms, with Reefs Point E. by N., and Harris' house as before: but this is not a good place to lie at, as a great swell sets in.

From Reefs Point the coast trends S. 61° E. nearly 1½ mile, to Point Galere, which, as before noticed, is the N. E. point of the island. The land between is of a moderate height. A reef extends about one-third of a mile from shore along all this space, and should not be approached nearer than the depth of 12 fathoms. There is also a rock to the eastward of Point Galere, about three-fourths of a mile, often visible, but on which the sea always breaks; and there is reason to suspect that some sunken ones lie still further out, and also within it.

The whole of the north coast is bold, with the exception of the places already mentioned; and the soundings extend several miles off, and are almost regular. Four miles N. by W. from Point Galere, there are 22 fathoms; half a mile farther off, 40 fathoms, sand and mud. Three and a half miles north from Point Sans Souci there are 23 fathoms; at the same distance N. by W. from Rio Grande, 20 fathoms; and at a similar distance N. N. W. from Point Matelot, 17 fathoms. N. by E., 5½ miles from Paria, there are 13 fathoms; N. by W., 2½ miles from the River Macapou, 21; and N., three-fourths of a mile from Chupara Point, 16 fathoms. There are 78 fathoms 5 leagues N. by W. from Escouvas; and 43 fathoms 5½ miles north from Maraccas Bay. North, 6½ miles from Point Corozal, there are 60 fathoms; and at 7 leagues N. by E. from Boca Mona, 93 fathoms. These depths decrease gradually towards the shore, very close to which are 8, 7, and 6 fathoms.

The bottom being every where good, sand and mud, a vessel having occasion to anchor, may choose her anchorage on any part of this coast, with the precaution not to go into any of the bays to leeward of Maraccas; as the high mountains there prevent the wind from blowing home, and the swell, in such a case, renders it difficult to manage a ship.

At Rio Grande, on the full and change days of the moon, it is high water at 4h 30m; and between this and Point Chupara, the last two hours of the ebb, and sometimes the whole of it, sets to the eastward along the shore.

EAST COAST OF TRINIDAD.—The range of high mountains extending along the north coast of this island, from west to east, continues on the east coast as far as Point Salibia. The highest part of the range, as before said, is near the meridian of Escouvas; on the east, the most elevated part is near Point Salibia.

The general bearing of the east side of the island, from Point Galere to Point Galeota, is S. 7½° W., about 41½ miles. Cape Galere, as before said, is comparatively low and rocky, with a heavy sea constantly breaking on it; and S. 7½° W. from it, 1¼ mile, is Point la Forest, having between a rocky bay, in which there is no landing. From Point la Forest, S. 40° W., 4½ miles, lies Point Guayamau. Between these the coast forms a bay, on the shore of which, and nearly midway, is the little settlement of Cumana. From Point Galere to Cumana the coast is very rocky. Cumana consists of 3 or 4 plantations, situated on land tolerably even, and rising with a gentle ascent from a sandy bay, which always affords good landing, although quite unsheltered, and as much exposed to the east, and to the consequent violence of the ocean, as the rest of the coast, along whose whole extent, except at this spot, a tremendous surf breaks. At three-fourths of a mile off there are 9 fathoms water, whence the depth decreases gradually to the shore. From Cumana to Point Guayamau, a distance of 2½ miles, the shore consists of some points of rocks and sandy beaches. From the latter point it becomes cliffy to within three-fourths of a mile of Balandra Point, and then a sandy beach almost to the point itself, which terminates in a scarped rock, and bears from Guayamau Point S. 40° W., at the distance of 4 miles. Balandra Bay is to the westward of the point: it is not large or deep enough to shelter any vessel larger than a trading schooner, in from 2½ to

* Harris' house is situate on a little hill at the S. E. side of the bay, and easily distinguished, being the largest in that neighborhood.

4 fathoms. The north part of this bay is a sandy beach, and at its west end a mountain torrent discharges; the shore thence is cliffy as far as Salibia Point, which is nearly a mile S. 48° W. from that of Balandra. The coast now bends more to the westward; and at the distance of nearly two miles W. S. W. ¾ W., is Patura Point, to the N. E. of which is Salibia Bay, where a small vessel, drawing 8 feet water, may find tolerable shelter within a small rocky islet on the north side. There is also anchorage about a quarter or a third of a mile to the southward of the islet, in 5 or 6 fathoms water, but more exposed. This islet lies four-fifths of a mile from Salibia Point; the rocky shore extends nearly as far, and thence to Patura Point is a sandy beach. About W. by N., half a mile from the islet, is the entrance of Salibia River, fit only for boats; and a little to the westward of it is a tolerably good landing place. Patura Point has a small islet, or rock, near it, and the coast is cliffy, though somewhat lower than before, for about two-fifths of a mile, whence it turns abruptly to the southward. Salibia is at the foot of the range of mountains which extends along the northern coast; and here ends the rocky quarter of Point Galere. From hence to the southward is a long sandy shore, the interior being a vast extent of land, apparently level, and of a moderate height, with a few distant insulated hills arising out of the plain; the whole covered with a continued forest.

We have just said that the coast turns abruptly to the southward, and is a sandy shore. It continues of the same description so far as Manzanilla Point, which is 9¼ miles S. 8° E. from Patura Point, with a surf breaking along its whole extent, so heavily as to render landing on any part of it totally impracticable. This is called Patura Bay; near the middle of it the River Oropuche discharges itself through the surf, and over a very bad bar.

At Manzanilla Point the coast turns suddenly to S. W. by W. and W. S. W., for about 1⅔ mile, chiefly rocky, but forming a small sandy bay, or harbor, of the same name, sheltered by some rocky islets lying near its east point. This bay has a depth of water sufficient for any vessel not drawing more than 9 feet; and, although very small, it is the best on all the east coast of the island. A reef of rocks stretches from Manzanilla Point eastward, rather more than half a mile; and nearly 2 miles S. 49° E. from the same point are three rocks, above water, over which the sea always breaks. Half a mile S. 71° W. from these rocks is another, so small, that it scarcely makes the sea break, and is not to be seen until you are close to it. Vessels from the north may run with great safety between the reef which stretches off from the point and these rocks; but the wind will scarcely permit a square-rigged vessel to lay her course through this channel from the southward. There is also some foul ground about two-fifths of a mile E. N. E. from the three rocks, on and near which the sea breaks in very bad weather. It shoals suddenly from 9 to 4¾ fathoms. A ship may anchor off Manzanilla Bay, in 5 fathoms water, with the leewardmost of the rocky islets at the entrance of the bay bearing N. W. about the distance of 3 cables' length, and Manzanilla Point N. N. E. This is by far the best anchorage on the coast, as a ship from hence will always have plenty of room to make sail in case of necessity. Here the flood and ebb streams both set north-eastward. Nearly W. S. W., about 3½ miles from Manzanilla Point, is the east end of Lebranche Mountains, which thence extend west south-westward. This, by estimation, is about 1000 feet above the level of the sea, and forms a conspicuous mark to know this part of the coast by.

COCOS BAY.—Close to the westward of the cliffy shore, on the west side of Manzanilla Bay, is the mouth of the little River Lebranche; and hence the coast again turns abruptly to the southward as far as the River Ortoire, a distance of 10½ miles; the shore being all a sandy beach, nearly straight, with the surf breaking heavily on it. This is called Cocos Bay, from its shore being bordered by a narrow grove of cocoanut trees 7 or 8 miles long. Near the middle of the bay the River Mitan discharges its waters. About half a mile eastward of the mouth of the Ortoire River, is a landing place behind a rocky point, on the north side of a scarped promontory, which advances 1½ mile into the sea, and presents a front of high cliff to the eastward, of about a mile in length, N. N. E. and S. S. W. This is called Mayero Point, (but by the Spaniards, Cape Guataro.) Several rocks and reefs lie off its N. E. part to a considerable distance; and it should not be approached from the east nearer than a mile, as there are only 3 fathoms at the distance of four-fifths of a mile from it, in that direction; but a vessel may anchor, at nearly a mile to the northward of this promontory, in 5 fathoms, good ground, having the N. E. part of the point bearing S. E. ¼ S., and the westernmost rocky bluff, which is near the mouth of the Ortoire, S. W. ¾ S. Mayero Point is remarkable at the distance of 5 or 6 leagues, from advancing into the sea, and also from the almost equal elevation of the whole tongue of land that forms it. It lies nearly 11 miles S. 13° W. from Manzanilla Point.

MAYERO BAY.—From the south part of Mayero Point, the land continues high and scarped for about two-thirds of a mile to the W. N. W., whence a low sandy beach begins, turning to S. by W. and S., and continues of the same description, with low land in the interior, as far as Point Galeota, which is 12¾ miles S. 8° W. from Mayero Point.

The space between these points is called Mayero Bay; and at its northern part the water is sufficiently smooth to afford good landing for two or three miles, although it is as much exposed to the east as the middle and southern parts, where a heavy surf breaks; and off this part, also, a vessel may anchor, as there are about 6 fathoms at 1½ mile off, and it shoals gradually to the shore. To the southward of Mayero Point are some plantations, and at the distance of 3 miles a church.

POINT GALEOTA, as we have before said, is the S. E. point of the island. Several rocks lie off it, but they are all above water; and at the distance of three-quarters of a mile to the E. and S. E. of it, is a depth of 10 fathoms. This promontory is of moderate elevation, and may be discovered from the north-eastward at the distance of 6 or 7 leagues. The soundings extend to a considerable distance off to the eastward, and shoal gradually to the land: these will be best understood by inspecting the chart.

SUNKEN ROCK.—Before we quit this part we ought not to omit mentioning a dangerous rock that lies 6 or 7 leagues from the land, although we are not acquainted with its precise situation. The surveyor,* when searching for it in the direction that was pointed out to him, found a bank of 16 fathoms, with deep water all around it, on which it is supposed to exist. This bank lies 7 leagues S. 37½° E. from Point Galere, and N. 82° E. from the mountain of Lebranche, distant 6½ leagues from Manzanilla Point. There is no doubt of its existence, a vessel having been wrecked upon it; and it has been seen by several persons at very low spring tides; it is a very small rock, and steep close to.

SOUTH COAST OF TRINIDAD.—From Point Galeota to the Point de la Grande Calle, it is 4 miles S. 75° W. The coast between forms Guaya-Guayara Bay, which is spacious, with a sandy shore, but so shoal that nothing can be sheltered in it, except very small vessels, there being only 3 fathoms water a mile from the land. A rocky shoal lies nearly in the middle of it, and there are several rocks near Galeota Point, but they are all above water. From Point de la Grande Calle the coast trends S. by W. ½ W., all scarped and rocky, to Point Casa Cruz, a distance of 5¼ miles. All along this part there are 5 fathoms water at a mile and a half from the land. From Point Casa Cruz the coast runs nearly west, with several inflections, about 32 miles, to Point Tabaro, the shore being chiefly scarped with two or three spots of sandy beach, and a few rocks at the projecting points. From Point Tabaro the coast trends W. by N., about 2½ miles, to Point Herin, a projecting point of sand, with some rocks lying off it. Nearly 5 miles W. by N. from the latter lies Islot Point. The coast between is sandy, and forms a small bay, called Herin Bay, in which there are 3 or 4 fathoms water. The coast from hence trends W. S. W., nearly 6 miles, to Point Quemada, the shore being all sandy. About midway lies Point Chaguaramas. About 3 miles to the westward of Point Quemada is Point Icacos, or Icaque, the south-western extremity of the island. We have already said that Point Galeota may be distinctly made out at the distance of 6 or 7 leagues. From this point the land begins to be more elevated, and continues so along the south coast. No part of this coast can properly be called mountainous, although it is very hilly; but these gradually diminish from the vicinity of Point Herin towards Point Icacos, which is quite low and flat. The hill of Guaya-Guayara, at the eastern extremity of this range, and about 1½ mile N. W. by W. from Point de la Grande Calle, is 760 feet high by admeasurement. This may serve as a guide whereby to estimate the height of the others. There is a watering place about a mile to the westward of Point Casa Cruz, where, with a little trouble, water may be obtained from a mountain stream that falls into a well on the beach. Five fathoms will be found at a mile and a half from the shore, in which depth you may run along the coast; but it is more advisable to keep at 2 miles from the land. You will then be in 8 or 10 fathoms, and clear of all risk. At the distance of 3 or 4 leagues to the eastward of Point Icacos, a reef of rocks lies upwards of a mile from the land. It does not show itself, but some red cliffs on the shore will nearly point out its situation. After passing Point Quemada, you may approach the shore to a quarter of a mile without the least risk.

POINT ICACOS, OR ICAQUE, is a sandy promontory advancing into the sea in a circular form, but so steep, that at half a cable's length there are 8 or 9 fathoms water. From its S. W. part it first runs northward, about 1⅓ mile, to Point Corral, and thence north-eastward, 1⅓ mile, to Point Gallos, which has two or three islets lying off its west side.

WEST COAST OF TRINIDAD.—From Point Icacos to Port d'Espagne, the bearing and distance are N. 36° E. 43 miles. All this part is low, excepting Mount Naparima, which is round, and 602 feet high. In clear weather, it may be seen at 8 leagues distance, and is a good mark within the Gulf of Paria.

From Point Gallos, before mentioned, to Point Cedro, it is 5½ miles N. 61° E., the coast between forming a bay of the same name, the N. E. part of which is flat at a consi-

* Captain E. H. Columbine.

derable distance off. From the point a spit projects westward, and at its extremity, two-thirds of a mile from the point, is a rock called the Barrel of Beef. A shoal of 9 feet lies also about 3 miles N. E. ½ E. from the same point. N. 62° E., at the distance of 14 miles from Point Cedro, is the N. W. extremity of Cape, or Point Brea, or Pitch Point. Between these the shore forms two shallow bays, separated by Guape Point. Cape Brea presents a front of two or three miles in extent, projecting to the N. W., and within it is a wonderful lake of pitch or bituminous matter. In the bay to the southward, about a mile from Point Brea, there are two small rivers of excellent fresh water close to the beach.

From the north part of Point Brea to Mount Naparima, the bearing and distance are N. 69° E. 9½ miles, and from the latter to Point Cascaal, the coast trends N. 6° W., 11 miles. The shore between Cape Brea and Point Cascaal forms a deep bay, with shallow water, into which several rivers disembogue; of these the first is the Sibaira, at about 1¾ mile to the S. W. of Mount Naparima. Between this river and the mount, at two-thirds of a mile from shore, lies a farallon, or rock, and to the W. N. W. of it, full 2 miles, the water is shallow. At the foot of the mount, on its west side, is Petit Bourg, and to the northward of it are the little rivers Taronga and Guaracaro. About 2½ miles to the northward of Petit Bourg is Stony Point, at the western end of the middle range of hills. The coast thence trends about N. ½ W., 8¼ miles, to Cascaal Point, bordered with shallow water to the distance of 4 miles off. About S. E. by S., 1⅓ mile from Cascaal Point, is the mouth of the little river Coura, and 1⅔ mile N. E. ½ E. from the same point, is that of Carapichima, of a similar description. From hence it is N. 13½° W., 9 miles, to Port d'Espagne; the land between is low and swampy, through which the little rivers Chagouane, Aripo, and Arouca, discharge their waters.

Here we discontinue the description of this coast from the south, resume it again at the Bocas, and conclude at Port d'Espagne.

Mona Point, as we have before said, is the N. W. extremity of the island. From thence to Taitron's Point, or Punta del Diablo, it is little more than 1¾ mile S. 8° E. At three-quarters of a mile from the former lies the north point of an islet, called the Careenage of Mona, which runs in north-eastward more than half a mile, and has from 17 fathoms, at the entrance, to 4 and 3 at the extremity. At the head of this inlet, or bay, a ship of the line might lie secure to the shore, land-locked. Off the sandy shore which forms the east side of it, there is a bank which shoals suddenly: it will therefore be necessary to keep on the opposite shore, if you should have occasion to work up so far. Taitron's Bay, called also Ensenada del Infante, lies to the northward of Taitron's Point, is about one-third of a mile wide, and of nearly the same depth, having a sandy beach at its head, and a depth of 15 fathoms at the entrance. The high land between these bays is 1400 feet above the surface of the sea. Westward from these points lie the three islands, Mona, Huevo, and Chaca-chacare, which form the Bocas, and which will be described hereafter.

GASPAR GRANDE.—S. 4° W., one mile from Taitron's Point, lies the west point of Gaspar Grande, named Espolon (Cock's-spur.) This island extends eastward nearly 1¼ mile to Punta de la Reyna, the east point, and is about half a mile broad. Its elevation is considerable, the highest part being 337 feet; and its coasts form some coves, or little bays, in which small vessels may anchor.

From Taitron's Point the coast of Trinidad runs S. 73° E., four-fifths of a mile, to Punta de San Jose, whence it bends in to the N. E. and E. 1¼ mile, and thence to the S. S. W., about two-thirds of a mile, to Punta San Carlos, being the west part of Chaguaramus Peninsula. This point lies almost 2 miles S. 65° E. from Taitron's Point, one and one-tenth mile S. 60° E. from Punta de San Jose, and 740 yards to the eastward of Gaspar Grande. Gasparilla Island lies to the southward of Punta de San Jose, and has an islet on its north side. This island forms two passages: that on the north is 250 yards wide, with 5 to 15 fathoms water; and that on the south, between it and Gaspar Grande, is 740 yards wide, with from 9 to 14 fathoms water.

CHAGUARAMUS BAY is comprised between Gaspar Grande, on the S. W., the west side of the peninsula on the east, and the land on the north. It is spacious, and affords good anchorage. The shores are bold, except off the large plantation, which is situated in the principal valley on the north side, whence a shoal of 1 to 3 fathoms extends 600 yards off. Its outer edge trends to W. N. W., and is very steep. Vessels may anchor in this bay any where; but the most convenient spot for watering, is in 12 fathoms, with the east end of Gaspar Grande bearing S. by E., and Taitron's Point in a line with Punta de San Jose. There is a wreck of one of the Spanish ships of the line that were burnt here at the taking of the island. It lies in 17 fathoms water, having the western Diego Island open 1° 10′ of Punta San Carlos, and the north extreme of Gaspar Grande W. by S. Avoiding this wreck, a ship or two may water very well here.

At full and change of the moon, it is high water by the shore at 3 o'clock, and it rises about 5 feet; but at the anchorage the flood stream runs until half past 3 o'clock. The flood runs to the eastward, and continues only 5¼ hours; the ebb runs to the westward,

ESCONDIDO HARBOR.—To the northward of Punta San Carlos, or Escondido, is a little harbor, named Escondido. From this point S. S. E. $\frac{1}{2}$ E., four-tenths of a mile, is Prince's Point; and thence to the east end of Chaguaramus Peninsula it is about E. N. E. $1\frac{1}{10}$ mile. From this latter point to another point at the west side of Lynch's Bay, it is N. 55° E., $1\frac{1}{10}$ mile. To the N. W. of the east point of the peninsula, nearly half a mile, is an inlet, or bay, called the Careenage, an excellent harbor for merchant ships, but too shoal for men-of-war, there being only from 10 to 23 feet water. North-eastward from this bay is another, with $2\frac{1}{2}$ to 4 fathoms in it.

DIEGO'S ISLANDS.—To the S. and S. E. of Prince's Point, about one-third of a mile, lie Diego's Islands, two in number, of about a quarter of a mile in extent each, and the same distance asunder, N. E. by E. $\frac{1}{2}$ E. and S. W. by W. $\frac{1}{2}$ W. There is a good passage between them of 9 to 12 fathoms water, and also between them and Prince's Point, of 20 to 25 fathoms.

COLORAS.—The Coloras are a cluster of small islands, five in number, occupying a space of four-tenths of a mile. They lie $1\frac{1}{3}$ mile E. $\frac{1}{2}$ S. from the easternmost of Diego's Isles, and $1\frac{1}{8}$ mile S. E. from the east point of the peninsula. There appears to be a passage between the two southernmost and the others.

PORT D'ESPAGNE.—From the point on the west side of Lynch's Bay, the coast, with some inflections, trends E. S. E. a distance of $5\frac{2}{3}$ miles to Port d'Espagne, and there turns about S. S. E. $1\frac{1}{2}$ mile to the River Caroni, which in the rainy season pours out a furious stream. The water in the road of Port d'Espagne is very shallow, there being only $3\frac{1}{2}$ fathoms at a mile and a half off. It is extremely foul and muddy there, and nearer to the shore it is proportionably more so. At about $1\frac{1}{2}$ mile off from the shore, with the round white tower on a hill near the town bearing N. E. by E., there are $3\frac{1}{2}$ fathoms, very soft mud, but ships may anchor any where. The ship will turn the soft mud up long before she gets into a good anchoring place, which should be in about 3 feet more water than she draws. The water is always perfectly smooth.

The tide flows here, on full and change days of the moon, at half past 5 o'clock: the flood comes from the west, and the ebb from the S. E.; and the water is slack about $1\frac{1}{2}$ hour, both at high and low water. The course of the tides, both ebb and flood, being each checked by an opposing shore in this corner where the town is situated, they naturally must deposite there much of the mud which they carry along with them: hence the quantity of mud in the anchorage.

The coast of the main land is low and swampy, opened by a great number of rivers and channels falling into the Gulf; of these the deepest and most frequented, is the Guarapiche, by which a trade is carried on with the interior of Cumana: it is navigable for schooners and large balaxues.

Description of the Islands which form the Bocas.

The northern passages into the Gulf of Paria, between the N. W. end of Trinidad, three islands lying off it, and the Coast of Paria, were by Columbus called Bocas de Bragos, from the velocity of the current which he found setting through them. This, however, is very various in its strength, though constant in its direction to the northward.

MONA ISLAND.—The three islands which form the passage, are Mona, or Ape's Island, Huevo, or Egg Island, and Chaca-chacare. The first is about $2\frac{1}{8}$ miles in length from N. E. to S. W., and $1\frac{1}{3}$ mile in breadth: it consists of two lofty hills, from which the land on the south side shelves down to the sea, in ridges singularly sharp: the highest of these hills, at the north part, is 1013 feet above the surface of the sea. On the east side of the island are two bays; the northernmost named Morris' Bay, the other Dehert's, besides some coves; to the westward of these, on the south side, are some others. The N. E. point of this island bears about S. W. by W., distant half a mile from Mona Point, and the S. E. point W. N. W. $\frac{1}{3}$ W. 1330 yards from Taitron's Point; but in the narrowest part, the channel is not quite one-third of a mile wide. This is called Boca Mona; it lies nearly north and south, and has from 23 to 47 fathoms water in it. A cluster of rocks lies about 300 yards E. N. E. from the N. E. point of Mona Island; these have 8 fathoms close to them.

HUEVO, or EGG ISLAND, is the next; this is of a semi-circular shape, forming a bay on its S. W. side. Its N. E. point, near to which lies the Umbrella Rock, is distant one and one-tenth mile W. by S. from the N. W. part of Mona Island, and thence extends $1\frac{1}{4}$ mile about N. W. by W. $\frac{1}{2}$ W. Its south point lies one mile W. N. W. $\frac{2}{3}$ W. from the S. W. point of Mona. Huevo, near its N. E. point, is 655 feet above the surface of the sea. The channel between it and Mona is called Boca Huevo, or more commonly the Umbrella Passage, from the rock of that name; the course through is about S. W. by S. and N. E. by N.; and its narrowest part, which is near the S. W. entrance, is about three-quarters of a mile wide, with a depth of more than 100 fathoms.

CHACA-CHACARE is the westernmost of the three islands; Point St. Jago, the east point of this island, lies three-quarters of a mile nearly W. S. W. from the south point of Huevo; and thence extends about N. W. $\frac{1}{4}$ N. one and four-fifths mile to the

north point, near which is an islet; and thence turns about S. by W. ½ W., nearly the same distance, to its S. W. point. From the latter to Point Antoine, the S. E. point, the coast runs about E. ½ N. 1⅓ mile; and from this point to that of St. Jago, N. E. by E. about three quarters of a mile. Between the latter points a deep bay is formed northwestward, with safe anchorage, but difficult to get in or out of, except by warping. At the further end of this bay of Chaca-Chacare, which nearly divides the island into two parts, is a low sandy neck or isthmus. To the southward of this beach, and on the west side of the island, are some scattered rocks, at about a cable's length from the shore: and there is a small rock, with 2½ fathoms on it, lying one-third of a mile west from the S. W. point of the island, and S. 25°½ W. from its N. W. extremity.* The whole of the high land of the peninsula of Chaguaramus open to the southward of the rock at the S. W. point of Chaca-chacare, clears it on the south side: the angular altitude of the high hill on that point, from the top to the sea, at its foot, taken in a boat anchored on the rock, is 7° 50′. This hill is 426 feet above the surface of the sea; the north part of the island has an elevation of 810 feet. Here it is high water on full and change days of the moon, at 30 minutes after 2 o'clock.

The channel formed by Chaca-chacare and Huevo, is called Boca Navios, or Ship Passage; it lies S. E. by S. and N. W. by N., and is, at the narrowest point, the S. W. entrance, two-thirds of a mile wide. To the westward of this island is Boca Grande, of great extent, and almost free from danger.

Description of the Bocas.

The great depth of water in the three largest of the Bocas, namely, Nuevo, Navios, and Boca Grande, prevents anchoring in any part of them, except in case of absolute necessity, very close to the shore. A ship may anchor any where in Boca Mona, but in 30 or 40 fathoms, in mid-channel. The beds of these channels are much deeper than the bottom, either within or without them; as if they had been thus worn away by the constant operation of the Northern Current, which runs through them. In autumn its rapidity at times is so great, that ships are frequently driven out again, after having entered one of the passages with a good breeze; during the rest of the year its rate may commonly be estimated to be about 2 or 3 knots; but close to the S. W. point of Chaca-chacare, it runs much stronger. Except in autumn, the tide of flood, which sets through them into the Gulf of Paria, has a considerable power towards the top of high water, in checking this current; and at spring tides, the water is frequently perfectly slack in Boca Mona for an hour; and very nearly so in Boca Huevo.

Boca Mona.—In the Boca Mona, (the eastern mouth,) at ebb tide, the current runs outward with a velocity of 1½ or 2 miles an hour, and somewhat less at ordinary flood; so that, with the exception of about an hour near the top of a spring flood, it always runs outward. For this reason, and because it is subject to calms and eddy winds, occasioned by the great elevation of the coast, from being very narrow, (not exceeding one-third of a mile in width,) long and winding, and consequently full of eddies, it should not be attempted by a ship except in a case of necessity, although it is the windward one; but either of the others should be preferred. It is high water here, on full and change days of the moon, at 50 minutes after 3 o'clock.

A ship may anchor any where in the south part of this passage, and all along the south side of Mona. Dehert's Bay affords excellent anchorage, and there is deep water far into it; a ship anchored off the mouth of it in 15 fathoms, on clay, with the south point bearing S. W. by S., and found the ground so tough that it was with great difficulty the anchor was weighed.

BOCA HUEVO, EGG PASSAGE, (or, as it is now more commonly called, the Parasol, or Umbrella Passage,) is safe to attempt to run in at, if the wind hangs to the N. E., as it will then, probably, blow quite through the passage; but at any rate, if the ship cannot stem the current, there is ample room to back and fill her out again. The shores are bold, but care must be taken to avoid a rock at the S. W. point of Mona: although it is not above a ship's length from the point, the eddy of the flood tide at the springs sets directly over it. At ebb tide the current sets through with rather less velocity in the former; and during the last two hours of flood, it is nearly slack water: on this account, it being the shortest, being to the windward of the other two, and being entirely clean, it is considered the best for entering the gulf. It is advisable to keep

* There is another rock lying off the S. W. point of Chaca-chacare, with only 9 feet water on the shoalest part of it, at low water, with very deep water all around; it is about 40 yards in circumference. This rock was discovered on the morning of the 26th of June, 1809, by Captain Sughree, of the ship Samuel, of London, drawing 17 feet of water, who struck and remained fast upon it for several hours. While this ship was aground two others passed, one on each side, without touching, although not at 25 fathoms distant. The bearings by compass from the ship were, Chaca-chacare, S. W. point, E. N. E., El Plata, or Goose Island, S. W. by W. ¼ W.; and the S. E. end of Cumana, or Paria, W. by S.

closer to the Island of Huevas than to that of Mona, to avoid being becalmed by the high land of Mona, and also because the current inclines to the N. E.

BOCA NAVIOS, or SHIP PASSAGE, may be safely entered, if, when a ship hauls round the N. W. end of Huevo at a quarter or one-third of a mile distance, she can lie up high enough to bring the south end of the island on her starboard bow, so as to have the current under her lee; otherwise it will be improper to attempt it, as the current does not run fairly out, but rather inclines down on Chaca-chacare. With a flowing tide, it runs with a velocity of $1\frac{1}{2}$ mile per hour; but, at the ebb, frequently at the rate of $3\frac{1}{2}$ or 4 miles. It is high water, on full and change days of the moon, at 39 minutes after 3 o'clock. Although the entrance by this channel is practicable only under the above circumstance, with a flood tide; yet, on the other hand, it is far superior to the Boca Huevo for getting out of the Gulf; but, it is necessary, in so doing, to pay attention to the set of the current, as we have just mentioned, and also to the following:—

On June 5, 1804, at 7 P. M., His Majesty's ship Ulysses weighed from Chaguaramus Bay; but, falling calm, it was 10 o'clock on the following morning before she reached the south point of Huevo, with an intention of going through Boca Navios. Here was found such a strong current setting round that point to the E. S. E., that, being unable to stem it, she was let drive out through the Umbrella Passage, which took up two hours to perform, owing to a number of eddies and opposite currents, formed by the tide of flood setting into the Gulf, and contending against the usual stream setting outward. It was high water in the Bocas that day at about half-past twelve o'clock, being three days before the new moon.

BOCA GRANDE.—In this channel, at ebb tide, the current runs with less velocity than through either of the others, and at flood there is scarcely any. It is also very clean, with the exception of the sunken rocks lying off the S. W. point of Chaca-chacare, and of sufficient breadth to tack at pleasure; but, being the leewardmost, it is only resorted to in case of having failed to effect a passage by either of the preceding.

Remarks on the Currents on the Coasts of Trinidad and in the Gulf of Paria.

CURRENTS IN THE VICINITY OF TRINIDAD.—We have already stated that the western Equinoctial, or Tropical current, occasioned by the trade wind, being confined by the trending of the Coast of South America, is thrown in a collected force upon Trinidad, and runs there with great strength; we have now further to observe, that the force of this current is still further increased along its shores by the obstruction which the island itself presents against the free course of the stream; and by the waters of the Orinoco, which flowing through vast plains, subject to periodical inundations, and discharging itself into the ocean near this island, greatly increases the current in its vicinity, particularly about the months of August and September, when that river is at its greatest height. The River Amazon, also, collecting the waters of almost half the southern continent, may, perhaps, though at the remote distance of 280 leagues, contribute somewhat to its strength.

These currents vary much in their velocity at different times, without any apparent cause. It is said they run strongest in the declining quarters of the moon; but, of this no satisfactory proof has hitherto been obtained. Adapting itself to the coast, the current runs to the northward, along the east side of Trinidad, and takes a western direction between the Island Tobago and Point Galere, round which it runs with such accumulated strength, that it is scarcely possible for a square-rigged vessel to beat against it, round that point, although there are instances of its having been effected.

Passing Point Galere, it runs along the North Coast close to the shore, for a few leagues, as far as Rio Grande; but there it often quits the shore, and takes a W. N. W. direction, increasing its distance from the land till it gets to the northward of the Bocas, where it seldom prevails within 5 or 6 leagues, being repelled by the current which runs out of these passages: there the two streams blend and run to the westward.

Along the South Coast it always runs to the westward, seldom less than $1\frac{1}{2}$ or 2 knots, near Point Galeota, but often more; and as the opposite shore of South America contracts the channel towards Point Icaque, or Icacos, its velocity is much accelerated there, and may be estimated generally at 3 knots, but it frequently runs still stronger.

The channel between the Coast of America and the S. W. point of Trinidad, is called the Serpent's Mouth, through which the current enters the Gulf of Paria, dispersing itself over it. Near the shore of the Gulf, it is subject to the influence of the tides; but, in the middle, it always runs to the northward towards the Bocas; where its channel being again contracted, its velocity is proportionally increased. Having passed these straits, the body of this water preserves its northerly direction for 5 or 6 leagues, before it falls into the common course of the stream of the ocean, which is there W. N. W. But it is to be observed, that so soon as it has passed the Bocas, a considerable part diverges to the E. N. E., and either runs with some rapidity to windward, or so thoroughly destroys the effect of the western current, that a ship will seldom fail of working up, at least to Point Chupara, with ease, by keeping within a moderate distance of the shore. This

easterly current frequently extends to a considerable distance farther along the North Coast, as was experienced in the month of June, 1804, when His Majesty's ship Ulysses worked up to Rio Grande from Huevo, in 25 hours, although she never went more than 3 knots.

That part of the stream which goes out of the Boca Grande on the west side, turns round the N. E. point of Paria, and runs down that coast with such velocity, that if a ship bound to Trinidad should fall in with the land to leeward of this point, though ever so little, she must immediately stand to the northward again, at least so far as 13° of lat., out of the great force of the current, and work up to Grenada before she again attempts the Bocas. Even then, if she cannot lie S. E. by S. at least, her reaching them will be very doubtful; and her best mode of proceeding will be to go through the passage between Kick 'em Jenny and Carriacou, in order to weather Grenada, before she gets into the strong lee current that prevails between that island and Trinidad. This current renders it very difficult for ships to fetch Point Saline, in Grenada, from the Bocas: they generally only reach about 4 or 5 leagues to leeward of that island; hence the necessity of working to windward on the North Coast of Trinidad.

Practical Directions for making the Island of Trinidad, and for entering the Gulf of Paria.

[From the Derrotero de las Antillas.]

It has been already observed, that from July to November is called the rainy season in this country, in which the general trade wind is very light, and veering to E. S. E. and S. E.; and, that in the other months, it blows fresh from N. E., or E. N. E.; this circumstance, and the two channels by which the Gulf of Paria may be entered, occasions the preference to be given to the south entrance during the rains, and to the other during the dry season. It is, therefore, obvious that Trinidad should be approached with due regard to the season: from December to June the object is to make it about Point Galere; and from July to December, about Point Galeota. These two points being the N. E. and S. E. extremities of the island, cannot fail of being known. A ship coming from the eastward, and making the body of the island, will see the mountain of Lebranche ahead of her, and a flat low shore extending from thence about 4 leagues to the northward, where it is bounded by the northern range of high mountains. To the southward of Lebranche will be seen another, and more extensive low shore, at the extremity of which are the hills of Guaya-guayare. The range of high mountains which extend along the northern coast, may be seen, in clear weather, at the distance of 11 leagues, but Point Galere cannot be distinguished at more than 3 leagues, from being low.

The soundings off the eastern coast of the island, to the distance of 17 leagues, furnish a safe method of rectifying the place of a ship arriving from the eastward, and under circumstances of night, or cloudy weather, will save much time; for being in the parallel of the island, it is necessary to try for soundings, which may be done without more delay or inconvenience than that of trying at about every 20 miles, when the ship is supposed to be nearing the land. The depth of water and the latitude will give the situation of the ship with tolerable precision. Knowing this, no more is requisite than to steer for the Points Galere or Galeota, according to the season of the year, for entering the Gulf either by the north or south passage.* But, as it frequently happens that two or three days elapse without obtaining a meridian altitude, it is very possible that the mariner, supposing himself to be in the parallel of Trinidad, may actually be in that of Tobago, or even of Grenada, as the current sets with such violence to the N. W.: for this reason no opportunity of observing the latitude either by the moon, a star, or by altitudes of the sun, before and after he has passed the meridian, should be neglected. It is also advisable to make the land rather to the south than to the north of either of the points, as the currents will always favor working to the northward. The facility is still greater in times of the N. E. winds for getting up from Point Galeota to Point Galere. The passage may also be made from the latter to the former, but not with so much ease. So soon as one of the points or capes has been made out distinctly, the route to the mouths of the Gulf is as follows:

From Point Galere a ship may run along the coast at the distance of two miles, with an understanding of its being quite clean, as before described.

Point Corozal may be approached to half a mile. It will then be better to close more upon the land, to reach the mouths with greater facility.

Directions for the Bocas.

From the description already given of the islands which form the Bocas, and also of the Bocas, it is evident that the Boca Huevo, or Umbrella Passage, should be chosen

* It is necessary to be cautious of the sunken rock that lies about 7 leagues S. E. ¼ S. from Point Galere.

for entering the Gulf; and, that the best time is with a flowing tide, and with a wind that will ensure the ready working of the ship; but, if there be a four-knot breeze, there is no necessity to wait for the tide. At night, if the weather be clear, there is no inconvenience in entering the Huevos Channel, as the only risk is of getting too close to one of the little islets, and which is almost impossible to happen; but, if calms, scant winds, want of tide, darkness, or excess of caution, should determine the mariner to wait for a more favorable opportunity, he may anchor about two-thirds of a mile from the coast in 18 or 20 fathoms, except the wind be N. E., which raises a heavy sea: in such a case he will do better by keeping under sail, and making short tacks on and off shore. Along the coast from Point Toco to Point Chupara, the bottom is soft mud; on the meridian of the latter point it is coarse sand and fine gravel; and to the west of it, so far as the mouths, it is mud of a greenish color. These differences in the bottom will point out with sufficient accuracy what part of the coast the ship is on.

When a ship has passed through either of the channels, she should be kept close to the wind, on the larboard tack, in order to get away from the mouths, and near the coast of Trinidad; and she should, in general, be continued on this tack so long as the flood tide lasts, that she may go on the starboard tack so soon as the ebb begins, with a certainty of reaching the anchorage, or at least within a very little of it. It may probably appear to some persons, more eligible to make several tacks after entering the Gulf, and particularly so if the larboard tack is not the most advantageous; but it must be remembered that the strongest currents are in the narrows; and therefore, from remaining near the mouths, in consequence of having made several tacks, it would not be extraordinary if the ebb tide should force them through the channel again, or compel them to anchor to prevent it; and even if neither of these circumstances should take place, the ebb will be found unfavorable for gaining the Port d'Espagne. On the other hand, by having stood on the larboard tack within the Gulf, if necessary, as far as the parallel of Mount Naparima, the ebb tide will then very favorably assist the ship on the starboard tack, perhaps, so much as to reach the anchorage, or it will be gained by another short board. If calms or very light winds prevent gaining ground by keeping under sail, the kedge anchor may be let go; it will be sufficient to hold against the strength of the tide, and the use of large anchors should be avoided as much as possible; because, as they bury themselves so deep in the soft mud, there is considerable trouble in weighing them. In Port d'Espagne ships may anchor in the S. W. part, in 4 or 5 fathoms, according to the ship's draft: moor N. W. and S. E.

At about 4 miles within the Bocas, soundings may be got with the hand line, in 20 fathoms; from whence, in standing southward, the water soon shoals to 14, 13, and 12 fathoms, which depths will continue several miles; but the soundings are not quite regular, though nearly so, there being some small banks with 6 or 7 fathoms on them, 5 or 6 leagues from the shore. When about 6 or 7 miles from Point Brea, the depths will increase suddenly to 17 and 18 fathoms: the latter will continue until about $2\frac{1}{2}$ miles from the shore: the water then shoals gradually to 3 fathoms, about the length of a cable and a half from the beach. The best anchorage off this part of the island is with the town of Brea, which consists of 5 or 6 old houses near the beach, bearing about south, or S. by E., one mile off the shore, in 6 or 7 fathoms.

Running down the coast to the southward from Port d'Espagne, observe that about 8 miles from it, and off a point of mangroves, there are only $2\frac{1}{2}$ fathoms, at $1\frac{3}{4}$ mile from the shore. To the north-westward from Naparima Hill, about 7 miles, there are $2\frac{1}{2}$ fathoms, 2 miles distant from the land, and this bank is steep, with 10 fathoms not far without it. Go into no less than $4\frac{1}{2}$ fathoms between Point Brea and Point Cedro; from the latter to Point los Gallos, the shore is flat, and a ship may be guided by the lead.

"The following remarks on Boca Huevo were made in September, 1826, by Captain Samuel Chambers, of his Majesty's ship Druid. He says—'As had been recommended, we tried the second passage two different evenings, approaching it with a fine breeze; but when almost through, both times, the current forced her out; and the second night, had not the boats been ready down, and she a quick ship, she must have gone on shore. According to calculation, this was at flood tide We immediately bore up for the Great Bocas, where we soon got through;* therefore, I by no means recommend any passage but the large one, as the advantage is trifling comparative with the safety of your ship. For, when through either, in less than an hour, with a moderate breeze, you come in 13 fathoms water, when you may anchor.'"

Description of and Directions for the South Channel.

So soon as the ship has reached Point Galeota, she should be kept along the shore of the island at the distance of two miles or less; at the distance of two miles she will be in from 7 to 9 fathoms, clear of all risk; and although it may be perceived that the water

* In going through this passage be careful of the rock that lies W. S. W. from the S. W. point of Chaca-chacare, as well as that which lies one-third of a mile due west from it.

is of different colors, particularly to the eastward of Point Herin and about it, there is no reason to be suspicious of shoals, as the variety of colors is occasioned by the current. On clearing Point Quemada, she may near the shore to a quarter of a mile, without the least risk, to gain that channel which, under the existing circumstances, may be most convenient.

The First Channel is formed by Point Icacos, or Icaque, and a shoal lying to the west of it, distant about half a mile, and which is from east to west about two cables' length, with 1½ fathom, rocky bottom. In the channel there are 9 fathoms water. Point Icacos, as before said, is a sandy promontory, advancing into the sea in a circular form, but so steep, that, at half a cable's length from it, there are 7 or 8 fathoms. The current in this channel sets to the S. W. at the flood, with a velocity of 2½ miles per hour, and N. W. with the ebb, at the rate of 3 and 3½ miles.

The Second Channel is formed by the rocky shoal and a bank of rock and gravel lying to the N. W., upon which there are 4 fathoms. This point bears from Point Gallos S. 60° W., distant 3 miles, and from Icacos N. 73° W., distant 2 miles. The greatest extent of it is three-quarters of a mile, N. W. and S. E. The currents in this channel set in nearly the same direction as in the preceding one. Its breadth is about a mile.

The Third Channel lies between the bank last mentioned and the Islote del Soldado, (Soldier's Islet,) with the reefs and shoals on the S. and S. E. of it. This channel is about two short miles from east to west. About 2½ cables from the reef off the east part of Soldado there are 6 fathoms water, in mid-channel 8, and near the bank 5½. At flood tide the current sets W. by S., with the velocity of 3½ miles; and with the ebb N. W. and W. N. W., at the rate of 4 and 4½ miles per hour.

The Fourth Channel is formed by the Soldado with the reefs and shoals on the south of it and the main land. The breadth of it is about 4 miles. The currents always set to the N. W. and W. N. W., with a velocity of 4½ or 5 miles per hour, in mid-channel, and near Soldado; but at half a mile from the main it runs only from 1½ to 2 miles.

To enter the First Channel, it is only necessary to near Point Icacos at about a cable's length, luffing up by degrees as it is passed, and then steering north, to pass at a convenient distance from the Points Corral and Callos. This passage can never be attended with difficulty, either by day or night, especially at ebb tide, as the current will keep the ship clear of the shoal; and if it should be necessary to anchor, there will be no risk of getting aground, as the shoal will be at least 3 cables' length distant from the ship.

To enter the Second Channel, it will be necessary, after having passed Point Quemada, and approached the coast to a quarter of a mile, to place the ship's head towards Soldado, and keep her so until Point Gallos comes open of Point Corral, and then luff, but without going to the N. N. E., until Point Corral bears east; she may then be kept along the coast of Trinidad.

To pass through the Third Channel, the ship's head ought to be placed towards the Soldado, in the same manner as for the second, and kept in that direction until Point Gallos bears N. 67° E.; then luff up to N. until the south front of Point Icacos bears S. E. by E., and Point Gallos N. 83° E.; then run along the coast of the island.

To pass through the Fourth Channel, you have only to pass at 2 miles S. of the Soldado, and when it bears N. E. luff up to N., and keep luffing by little and little to coast along the island of Trinidad. Care must be taken not to get within 2 miles of the Soldado, observing that the current will set the ship strongly to the N. W.

Hence it results, that at any time a ship may enter the gulf by the South Channels, even by night, if not very dark; that the First Channel is the best, not only because it is the windward one, but by keeping the luff, every danger will be avoided, especially with the ebb tide. In fact, there can be no danger whatever, if an anchor be ready to let go in case of a sudden calm, or other cause, that might carry the ship towards the shoal. In the night time either of the channels can be more easy to enter than the first; for as the point must necessarily be passed within a cable's length, every impediment from darkness will be avoided, because at so short a distance it can be very distinctly seen.

But however easy the entrance into the gulf by these channels is, if any circumstance, either of calm or want of day-light, may render it advisable to wait some time before attempting it, the ship can be anchored on the south coast of Trinidad; for if kept under way and tacking, as the current always sets inward, it will be very difficult to maintain a determinate position.

On getting through the channels into the gulf, steer for the west coast of Trinidad, and keep along it, at 2½ or 3 miles distant, as far as Brea Point. Port d'Espagne is not above 8½ leagues from this point, and steering N. by E. ½ E., the buildings in it will soon be discovered. If this course cannot be made good, recourse must be had to tacking; but the boards must not be stretched within 4 miles of the shore, on account of the shoal that lies off it; and if standing into the Bay of Naparima, it will be necessary to be careful of two shoals, one west of the mount, distant about 2½ miles, and the other S. 75° W. of it, distant 4 miles. In proceeding from Brea Point to Port d'Espagne, the depths are from 7 to 12 fathoms, at the distance of 3 miles from the point; then 14 fathoms for

about a mile; after which, 18 or 19 fathoms for nearly 10 miles; and then a gradual decrease to 5 fathoms, at the distance of 2½ miles S. S. W. from the town.

Good fresh water may be obtained from two small rivers in the bay, about a mile to the southward of Point Brea; at high water a boat may land close to it. Wood can be procured in abundance with little trouble, as the trees are very large, and close to the water side.

In September, 1821, his Majesty's ship Forte, Capt. Sir T. J. Cochrane, passed over a bank with only 4 fathoms water on it, at about 4 or 5 miles northward of the Soldado, and the same distance from the shore. The Captain says, "I felt a very strong smell of tar, or pitch, and observed some of the former floating on the surface, which, no doubt, oozed from the bank below. I have since learned it is composed of pitch, and that there is a spot on it with only 3 fathoms water; but being suddenly called from the station, I had no time to ascertain that fact."

THE COAST OF COLOMBIA, FROM THE GULF OF PARIA TO CARTHAGENA.*

In the description of the Island of Trinidad and the Dragon's Mouth, (Bocas de Dragos,) it was said that the fourth, or Boca Grande, is formed by the Island of Chaca-chacare and the main land. The most projecting, or N. E. point of the coast forms a lofty steep islet, called the Morro. This lies about 4 leagues N. 78° W. from Point Mona, in Trinidad. From the Morro the coast runs westward, with a little inflection to the south, for the distance of 19 miles, to the Bay of Mexillones, whence it trends a little northward to Cape Tres Puntas, (Three Points,) which is distant from the Morro 50 miles, due west. The whole of the land along this space is high and mountainous, and the shore perfectly clean, so that it may be run along by at half a mile distant. At the distance of a mile there are from 20 to 40 fathoms, on a bottom of muddy sand.

Cape Tres Puntas is the most northerly cape of all this part of the coast, and it continues to be equally as clean and deep as the preceding part to the Bay of Unare, a distance of two miles.

Unare Bay presents a good anchorage, sheltered from the trade wind. To enter it, it is necessary to keep about a mile from the N. E. point, which is fronted by a rocky shoal extending half a mile out; then stand in and anchor in 5 or 4½ fathoms, sandy bottom, immediately on getting round within the point. A little river falls into this bay, and on the hill to the east of it, there is an Indian town named San Juan de Unare. The S. W. point of the bay sends off a reef, with several islets upon it, to the distance of half a mile. Passing outside of them, and at about two cables' length from the most northerly one, will clear every danger.

From Unare Bay the coast continues to run west, with some inflections to the south, for the space of 10 miles, whence it turns gradually to the northward of west, for 9 miles farther, to Cape Mala Pascua, between which and Cape Three Points all the shore is clean, and may be coasted at a mile's distance, in 8 fathoms, sandy bottom. The bearing and distance from Cape Three Points to that of Mala Pascua, are S. 83½° W. 20½ miles.

TESTIGOS ISLANDS.—Nearly N. ½ W. from this cape, at the distance of 40 miles, lie the little islands called the Testigos. These consist of seven principal islands, besides several farallones, or high rocks. The passages between the islands are free and clean, and may be run through without any risk whatever; but the contrary is the case with those between the rocks, for they are very narrow. All those islands may be approached to the distance of two cables' length, or even nearer, if necessary, excepting that which lies most to the north-eastward. This is surrounded by a reef extending half a mile from it. Between the islands the bottom is sandy, and will admit of anchoring in case of necessity. The principal island, called Testigo Grande, (Great Testigo,) lies N. W. and S. E., about 2⅓ miles in length. The S. W. part affords good anchorage, sheltered from the trade wind, with a depth of 8 to 15 fathoms, coarse sand. It may be approached either by the N. W. or S. E. side. If by the former, it must be on the outside of the rock that lies off it; if by the latter, the passage is between the great island and another lying S. W. of it. The channel is sufficiently spacious; for at the narrowest part, between the rock and the east side of the little island, and another about a cable's

* From the Derrotero de las Islas Antillas, &c. &c. &c., segundo edicion, Madrid, 1820.

length from the S. W. coast of the large island, it is half a mile wide, with a depth of 8½ to 9 fathoms, on red gravel.*

Between these islands and the coast, there are soundings. About 5 miles to the S. S. E. of them lies a large bank of sand, with 4½ and 5½ fathoms water on it, which should be avoided by large ships.

From Cape Mala Pascua the coast runs nearly west 7 or 8 miles to the Morro of Porto Santo. This Morro is joined to the shore by a little low sandy tongue; and very near to the Morro on the west, lies an islet called Porto Santo. To the westward of the Sandy Tongue, is an anchorage sheltered from the trade wind, in 4½ to 5½ fathoms water, sand and mud. The north side of the Morro and island may be approached to 2 cables' length, if necessary. To gain the anchorage, immediately after passing the island, steer S., or S. by W., and anchor in 4½ or 5½ fathoms, so soon as shelter from the wind is obtained; but taking care not to get to the eastward of the western part of the islet, because there lies a bank in that direction with only 3 fathoms water on it. Southward from the Morro, and about 2 leagues inland, stands the mountain of Porto Santo.

From this bay the coast inclines to W. S. W. for the space of 3½ miles, and sends off a bank with little water on it, about half a mile, and extending all the way to the point of Hernan Vasquez, which forms another little bay, with an anchorage of 5½ to 6½ fathoms water, sheltered from the trade wind. From a river that disembogues into the Bay of Hernan Vasquez, fresh water may be obtained; and to the southward of its western point, off which is a small islet, stands the town of Carupano: two miles west of Carupano are the Point and Morro of Salines, or of Jarro, with an islet near to it, which, with the point of Hernan Vasquez, forms the Bay of Carupano, including that of Hernan Vasquez. There are two shoals at the entrance of this bay, lying a little to the northward of the parallel of Point Hernan Vasquez, and westward of the meridian of Carupano: of these, the first has 2¾ fathoms on it, with 5½ close to, and lies one mile W. N. W. from the point; the other lies 1¾ mile W. ⅔ N. from the same point, and 1¼ mile N. E. from Point Salines: this has 1½ fathom on it, with 4¾ fathoms close to it. A third shoal, of 3¼ fathoms, with 5 close to it, lies within the bay, at three-quarters of a mile W. S. W. ⅓ W. from Point Hernan Vasquez, and the same distance north from the town of Carupano; and westward of the town there is a bank, with little water on it, extending from the shore northward nearly three-quarters of a mile, and one mile E. N. E. from the islet at Point Salines.

MORRO BLANCO.—From the Point and Morro of Salines to Morro Blanco, a distance of 3 miles, nearly west, the coast is clean, with several patches of small rocks lying close to the shore: nearly south of this Morro, and about 3 leagues inland, the Mountain of San Jose, or St. Joseph, may be seen.

From Morro Blanco to the westward, a bank runs off, with little water on it, that does not permit the coast to be approached nearer than 2 miles: on this part of it, there are, 1st, the Point and Morro of Padilla, known by an islet and several rocks extending to a little distance from it: 2d, the Point and Morro of Taquien, which projects farther northward than the preceding, and is also surrounded by several islets: 3d, the Morro of Lebranche, which is joined to the main by a low sandy and swampy tongue of land; and 4th, the Morro de la Esmeralda, or Emerald Morro, which is an islet separated from the coast by a channel of about half a cable's length wide. Between Lebranche and the Emerald Morro, at a moderate distance from the land, lie the Garrapotas Islets; but from rocks and shoals there is no passage between them: there is, however, between the most southerly islet and the main land, a good passage; but the better way, always, is to go on the outside of them, especially with large ships. From Morro Blanco to the point of Taquien, the distance is 3½ miles, N. 83½° W., and thence to the Emerald Morro, 8½ miles, S. 75° W. Southward of the latter, and about 13 miles inland, will be seen Mount Redondo.

ESMERALDA BAY.—To the westward of the Emerald Morro there is formed a large bay, but it is obstructed by a bank, with very irregular soundings, which extends from the middle of the Morro about south and S. W., nearly a mile, then S. W. by S. to within one-third of a mile of the coast, whence it turns to the eastward, and runs parallel to the shore, at about that distance from it. In the bay and on the bank, there are three islets, called the Cascabels, lying nearly east and west. On going to anchor in this bay, ships may pass as close as may be necessary to the north and west of Emerald Island, and anchor under shelter of it, at the distance of 2 cables' length, in 5½ to 6½ fathoms water, sandy mud.

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* The Testigos may be seen from the distance of 5 leagues. The Great Testigo, called Goat Island, abounds with land tortoises. It is not inhabited, except in the season, by turtlers. It appears a bold shore, and has a sandy beach near its north end. August 27, 1826, his Majesty's ship Valorous, Captain the Earl of Huntington, anchored here in 16 fathoms, on sandy bottom, about 1½ mile from shore, the north end of the island bearing N. ½ E., and the south end E. S. E. ½ E.; found the current setting west north-westward, 1½ mile per hour. No fresh water to be had.

From this bay the coast runs west about 5 miles to the Point and Morro of Manzanilla, all the way bounded, at the distance of one-third of a mile, by a bank which extends from the Emerald Isle. The Point of Manzanilla forms a bay: but it is obstructed by the same bank of which we have spoken, and which terminates at the first steep point, about two-thirds of a mile to leeward of the bay; it not only impedes entrance into the bay, but also prevents steering to the southward before getting to the westward of the said steep point. From this situation, west of the point, the coast is quite clean for the space of 8 miles, to Point Guarapoturo, where another bank begins, and extends two-thirds of a mile from the coast. About one mile N. E. of Point Guarapoturo lies a sunken rock that must be carefully avoided. A little eastward of this point, and about a league inland, will be seen the peak of a mountain called Pico del Este, Peak of the East.

Three miles westward from Guarapoturo Point, is that of Escudo Blanco, or White Shield Point, the coast being steep and high; but from that the coast runs out about N. W., very low and swampy, for the space of 2¼ miles, where there rises a Morro called Chacopata, which forms a point, projecting into the sea almost 2 miles. From this point the coast takes a southerly direction and forms a great bay, in which, at 1¾ mile west from the middle of the said Morro, there is a little island called Caribes; at about a mile west of Caribes Island is an islet called De Lobos, or the Wolf, with a rock close to the east part of it. The shoal bank that begins at Guarapoturo Point, also borders this part of the coast, and reaches about one third of a mile from the Morro Point; it thence continues to Caribes Island, whence it turns to the south, bearing so close upon the shore that at Cayman Point, the southernmost and westernmost of the bay, it does not extend more than half a mile.

N. 8° E. from Chacopata, at the distance of 17 miles, lies the eastern point of the Island Margarita, forming with the main land a channel 11 miles wide. In the middle of this channel are the Coche, or Coach, and Cuagua, or Cubagua Islands; and as a description of the coasts on both sides of this channel will be necessary, we will first proceed along that of the main, so far as Araya, and then return to Margarita and the other islands.

From the Point and Morro of Cayman, the coast is level toward the west, the only salient points being those of Tuna, a mile and a half from the preceding, and the Point and Morro del Castillo, 2 miles beyond Tuna. From Castillo Point, the coast inclines somewhat to the north, as far as the Point and Morro of La Pena, a distance of 4 miles: this point lies S. 77° W., 14½ miles, from the Morro of Chacopata. From the point of La Pena, the coast descends somewhat to the southward of west to Point Gorda, a distance of 3¾ miles, from which it forms a bay with a very flat shore and beach to Point Guachin, or Guaranache, forming a piece of steep and high land, which rises above the low land and seems insulated by it; along the shore of the bay, there is a steep point of little extent, called Minas. From Point Gorda to that of Guachin, it is 6¼ miles.

From Point Guachin the shore continues low and flat, so far as Punta del Escarceo, or Eddy Point, where it rises a little; the distance from one to the other is 3½ miles; the latter bears from the Point La Pena N. 85° W., 12½ miles. Point Escarceo presents a front extending half a mile, the western extremity of which is called Point Cardon, whence the coast bends to S. 49° W., a distance of 2¼ miles, to Point Araya, the whole space being a very low sandy beach. About half a mile from Araya Point is another, called Point Chica. On Araya Point there are a few small houses, inhabited by people employed in the salt works. All the coast, from Point Cayman to that of Escarceo, sends off a bank about half a mile from shore, and which from the latter point extends four miles westward, forming what is called the Araya Shoal, the south edge of which terminates at Point Chica, to the southward of Point Araya. This will be cleared on the south side by bringing the most southerly of the houses on the Point to bear east. Thence southward the coast may be approached at 2 cables' length; for although the sandy beach is very flat, at that distance there are 5 or 6 fathoms water. The beach continues for 2 miles about S. S. E. to Punta de Piedras, formed by the western extremity of the Ridge of Guaranache; this point shows a front of about half a mile, and immediately within it the land rises to a lofty hill; on the south part of it stands a chapel, or sanctuary, dedicated to the Virgin of Agua Santa. The coast continues in the same direction of S. S. E., to Point Barragon; at first it is low and sandy, and afterward steep, but all of it is so clean that it may be coasted at a cable's length. On the south point of the little bay of Araya, where the high land of Point Barragon begins, there is a castle in a ruinous state. From Point Barragon the coast continues high and very clean, about S. E. by S., a distance of 2 miles, to Point Caney, from whence it changes its direction to S. E. by E., and continues for rather more than a mile to Punta de Arenas, or Sandy Point, which is the southernmost part of this coast, and northernmost of the Gulf of Cariaco. From Point Caney there is a bank extending along the coast as far as half a mile south of Point Arenas.

Here we suspend our description of the coast and return to

THE ISLAND OF MARGARITA.—The greatest length of this island is, from east to west, about 37½ miles; it is mountainous, and, when seen at a short distance from the north, it appears like two islands, from a space of low swampy land in the middle of it. On the eastern part there are several heights, that may be seen in clear weather from Cape Three Points, a distance of 24 leagues; and on the west part a ridge of heights called Macanao. The eastern point is named Ballena, and, as before said, lies N. 8° E. from Chacopata Morro; the coast runs thence N. N. W. ½ W. to Cape La Isla, a distance of 13 miles, forming the N. E. side of the island. The whole of it is clean, only sending off a bank of about 3 cables in breadth; two islets, named Isles of the Cape, lie about a mile and a half south-eastward of the cape, and about half a mile from shore. From Cape La Isla the coast runs S. W. by W. to Point La Galera, a space of 7 miles, all clean; there is also an islet lying 1½ mile N. E. by N. from the point, named La Galera, having between them 14 fathoms water, on sand and shells. From Point La Galera to Point Maria Libre, it is S. W. ¾ S. 3¼ miles; between these points there is a large bay* with a bank edging the shores of it, which in the centre runs off nearly a mile. On the shore opposite to the widest part of the bank, stands an Indian village.

Point del Tunar bears from that of Maria Libre N. 83° W., at the distance of 11½ miles: in the intermediate space there is a very large bay, running about 5 miles inland. The whole of this bay is very clean, and presents no other danger than the bank which borders it, which, at the widest part, extends only about half a mile from the land: the shore at the extremity of the bay is a low swampy beach. A reef of considerable extent runs off in a N. N. E. direction from Point del Tunar. From this point the coast trends about W. by S. for 8 miles, to Point del Tigre, the whole very clean, and may be coasted within half a mile; from the latter point the land bends to S. 72° W. for 2½ miles, to the Morro of Robledar, and thence S. S. W. a distance of 4½ miles, to the Punta de Arenas, which is the western extremity of the island. The bank of shallow water which surrounds the coast, extends about 1½ mile from the western part of the island, between the Morro of Robledar and Point Arenas. About N. W. ¾ N. 4½ miles from Point Arenas, and W. ½ S. 4 miles from the Morro of Robledar, lies the eastern edge of a rocky shoal, named the Ostial, having on its shallowest part 4½ fathoms; it thence extends about N. W. by W. 3 miles, and is nearly a mile wide. Between it and the Morro of Robledar, there are from 5 to 7 fathoms, on sand and mud; to the northward and westward, the soundings extend to a considerable distance; but on the S. W. side, at a short distance, the water is very deep.

Three miles and a half about S. W. from Ballena Point, are Point Moreno and Morro: the intermediate coast forms a spacious bay, on the north side of which stands the town of Pampatar. Nearly in a line between the two points, and about midway, lies the little islet called Blanco, which is very clean; the passage between it and the land is very safe. All parts of this bay afford anchorage in 7 and 8 fathoms water, at two-thirds of a mile from the beach: with the trade wind blowing fresh it is rather exposed, as there is no shelter; and although such a wind does not send in much sea, it will be advisable to anchor in such a position that, in case of necessity, there may be room to run freely for the Morro Moreno, which, if occasion require, may be passed on the east side, at the distance of a cable's length.†

From the Morro Moreno, the direction of the coast is S. W. ½ W. for a space of 6 miles, to Mosquito Point; the land between forming a great bay, on the north part of which stands the town, so called, of La Mar, but more correctly, a cluster of straw huts. The coast from Moreno Point to that of Mosquito is so *foul*, that it would be hazardous to get within two miles of it; the same character may be given to that farther westward. From Mosquito Point to Punta de Mangles, or Mangrove Point, the bearing and distance are S. 83° W. 10½ miles; the coast between is very foul, from a *rocky shoal*

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* Mr. William Waddy, Master of H. M. S. L'Amiable, in his remarks on this bay says, "In approaching it from the northward and westward, the soundings will be regular, from 30 fathoms at the distance of 4 leagues to 6 fathoms. Pass the islet of Galera at a discretionary distance, and in hauling round Point la Galera, which is high and bluff, you will see a fine open bay, where you may ride at anchor in safety, in from 10 to 4 fathoms, with Point la Galera bearing about N. E. ¼ E., distant about 2 miles."

†His Majesty's sloop Barbadoes, John Fleming, Esq., commander, anchored here in January, 1816. He says, "Ships from the eastward having approached Bellena Point to about a mile, should edge away to the S. W., sounding in 12 and 16 fathoms water, until Fort La Carranta comes open: this fort is on a point of land over the sea, about half a mile to the east south-eastward of Fort St. Carlos, which is situated in the middle of the town. With Fort La Carranta bearing N. W. ¼ N. by compass, distant one mile, there is good anchorage in 8 fathoms water; but this is not a safe and advantageous bay for a fleet to rendezvous in, there being little shelter against any weather, and a great scarcity of water and every species of provision. The forts command the anchorage."

"In sailing out of Pampatar Bay and bound to the westward, pass to the westward of Blanco Islet, on account of a reef lying off its S. E. side, which makes it dangerous to borrow near it in that direction."

that extends off about a mile. From Mangles Point the shore turns to the northward, forming a bay between it and Point Piedras, a distance of 3¼ miles: from the latter point it runs farther northward, forming another bay with Point del Pozo, which is distant 6¼ miles from the preceding. Point del Pozo lies 10 miles N. W. by W. ½ W. from Point Mangles; and from the former to Point Arenas, the bearing and distance are W. by N 12 miles. All that part of the coast from Mangles Point to Arenas Point is, like the preceding, *foul*, and should not be approached to less than 2 miles.

THE FRAYLES.—Nine miles E. N. eastward from Cape la Isla in Margarita, lie a group of islets, called the Frayles, or the Friars, of which the southernmost is the largest: they are all very clean, except the northernmost, which is surrounded by a *reef*, extending about two cables' length from it.

SOLA ISLET.—About 12 miles N. E. ½ E. from the largest of the Frayles, lies the little islet called Sola, which is very clean: from Sola to the Testigos, the distance is 27 miles. The passage between the Testigos and Sola, Sola and the Frayles, the Frayles and Margarita, are all so clear, that ships of all sizes may use them in any kind of weather.

Channel between Margarita and the Main.—In this channel there are two large islands; the easternmost one is called El Coche, or the Coach; and that on the west, Cubagua, or Cuagua. Coche Island is low, lying W. N. W. and E. S. E., about 6 miles in length, and 2½ miles wide. It is surrounded by a rocky shoal and reef, which extend from the N. W. and S. E. points about a mile and a half, and forms two channels; that on the north, with the Island of Margarita, which, in its narrowest part, is two miles across; and that on the south, with the main land, of nearly similar breadth in its most confined part. In both of them the passages are perfectly clear, * the bottom very good, and a vessel may ride at anchor in either of them as securely as in a harbor.

Cubagua is smaller than Coche Island, and lies nearly east and west; it is about 5 miles long, and 2 miles wide. From the east point there are a *shoal* and a *reef*, extending out about a mile; the north and south sides are very clean: but on the west side, a *rocky shoal* extends about one-third of a mile from the shore. This, like Coche Island, forms two channels,—one on the north with Margarita, and the other on the south with the main land—both very clear. In the narrowest part, which is between the *shoal* and *reef* which stretches out from the east end of Cubagua, and the *bank* that extends off from Mangles Point in Margarita, the width is 3½ miles.

In navigating the North Channel of these islands no other care is necessary than that of keeping in the middle of the passage; for, by so doing, the *banks* of Margarita, *that* from the N. W. of Coche Island, and *that* from the east end of Cubagua, will all be cleared; but for greater certainty, the most northerly little point of Cubagua may be brough to bear west; which course may then be kept on to pass Mangles Point, and then edging a little to the northward, so as to pass a cable's length to the northward of the said north point of Cubagua, every danger will be avoided.

To navigate the South Channel, † you ought to pass near to the Caribes and Lobos Islands, by which you will clear the bank that extends to the S. E. from Coche Island, and thence shape a westerly course without fear, as the three Tuna Islets, lying off Tuna Point, are very clean, and may be passed between, if necessary. From these islets westward, the channel widens considerably, and consequently requires less care. In all these channels it is advisable to anchor at night, in any part of them, when the ship is bound to Araya or Cumana, lest the current should carry her to leeward; and also be-

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* His Majesty's sloop Sapphire, A. Montgomerie, Esq., commander, when beating to windward in the south passage, on the 29th of April, 1821, struck on a *shoal* of 15 feet water; the Morro of Chacopata, bearing about E. S. E. ½ E. by compass, distant 2⅔ miles, and the west end of Caribes Island about S. ¾ E. 2 miles.

† His Majesty's sloop Bellette, J. Leith Esq., commander, ran through this channel on the 7th of March, 1825. He passed three-quarters of a mile to the northward of Point Chacopata, in 7½ fathoms water, (having gradually shoaled from the depth of 19 fathoms to the eastward,) and steered directly for the Island Lobos, in which tack he had not less than 4½, nor more than 5 fathoms, until arriving abreast of the said island. After passing it, the water began to deepen fast, but the wind blowing strong from the east, with an appearance of foul weather, he hauled towards the S. W. side of Coche Island, where the shoal extends only a short distance off, shortened sail and anchored in 9¾ fathoms water, on mud, about 3 miles off shore; * with the west end of Coche, a low sandy point, bearing N. W. by N., by compass; the S. E. end S. ½ E., Lobos Island S. E. by E. ¾ E., and Morro de Pena S. W ½ W. On the 8th, at 6, 30 A. M. he weighed; and after running 22 miles W. by S. from the anchorage, saw white colored water on Araya shoal ahead; hauled up to N. W. to avoid it, having found that a W. by S. course would not clear it; at 11 A. M. passed close round its western edge, and gradually hauled in for Point Piedras, &c.

* His Majesty's ship Valorous, Capt. J. Murray, anchored off the west end of Coche Island, at about 1½ mile off shore, in 7 fathoms, muddy bottom; with the N. W. end of the island, a low sandy point, bearing N. E. by N., its S. W. point east; Cubagua Island W. ¾ N., and Point Mangles in Margarita, N. N. W. ¾ W.; this anchorage is very good.

cause these ports should always be entered in the day time, that the shoal off Point Araya, and the shallow bank of Cumana, may be avoided.

To sail to the ANCHORAGE of ARAYA, the only danger to be avoided is the shoal off Point Araya, which, as before observed, extends 2½ miles to the N. W. of it: this may be effected by standing on about 3 miles from the point before the course is altered to the southward; or, what is nearly the same thing, to make no southing until having got out of soundings. But if it should be thought preferable to use land-marks, be careful not to cross the parallel of Point Escarceo, until the westernmost peak of four, on the height of Macanao, in Margarita, bears north, a little easterly; for when it bears N. 5° E. it will clear the west extremity of the shoal about half a mile. The Island of Cubagua will also afford a mark; for, by bringing the west point of it to bear N. E., the western edge of the shoal will be cleared two miles.* Hence it appears, that a ship bound to Araya, and having run down the South Channel between Coche and Cubagua on the north, and the main land on the south, should pass about a mile to the northward of Point Escarceo, and steer west until the west point of Cubagua bears N. E., when, by altering the course to the southward, she will pass two miles distant from the west edge of the shoal; and if it be desirous to keep closer to it, to avoid getting so much to leeward, it may be done by steering west, until the westernmost peak of Macanao bears N. 5° E., or rather more easterly; then bring her head to the southward, and she will pass at the distance of one mile from it. Keep on the south course, until she gets abreast of the southernmost house on Point Araya, then haul to the wind, in order to fetch into the little Bay of Araya, which will be known by the Fort on the south side, and the Sanctuary of Our Lady of Agua Santa on the north side, and on the south slope of Guaranche. In this bay, and also on every part of this coast, as far as Point Arenas, a ship may be anchored in any convenient depth, and, if desirable, at a cable's length from the shore.

In like manner, in doubling Point Araya from the northward, that is, from Cubagua or Margarita, the parallel of Point Escarceo should not be crossed to the eastward of the bearings before given; and if by any accident you happen to do so, you should immediately steer in an opposite direction, until you are due west from Point Escarceo; and then west, until the proper bearings come on—namely, the westernmost peak of Macanao N. 5° E., or rather more easterly; when you should steer south, so as to be able to haul to the wind on getting abreast of the southernmost house on Point Araya. On coming from the north, the soundings will also be a good guide, either by keeping out of them altogether, or, at least, by not getting into less than 35 fathoms, until after crossing the parallel before mentioned.

There are a shallow bank and reef stretching about half a mile south from Point Arenas, which have been already spoken of as the North Point of the Gulf Cariacou, which runs 35 miles inland to the eastward: at the broadest part it is 8 miles across, and may be considered as a spacious, well-sheltered harbor, there being good anchorage in every part of it; but the best is in 36 fathoms. The shores are very clean, and may be approached to half a mile, or even a less distance, except in the vicinity of Cumana, where a shallow bank extends about two-thirds of a mile from the shore. On the north side there are two harbors, called the Little and the Great, or Bishop's Lagoon; the former is very small, but the latter is spacious: and, besides having from 8 to 18 fathoms water, is so clean that there is no danger except what is visible. Its entrance is 12 miles from Point Arenas. Within the Gulf there is no town of consequence, or other inducement for ships from Europe to visit it; the main object of attraction for all is Cumana, which is situated on the South Point of the entrance into the Gulf. This point is low and sandy, with a bank running from it to the west and south, so steep that, from 10 fathoms, there are almost immediately 5; and from 5, a ship would be aground before getting another cast of the lead. The edge of the bank running eastward, lies nearly east from the point, about 4 miles, to Punta Baxa, or Low Point, whence it turns to south-east-

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* His Majesty's sloop Esk, Edward Lloyd, Esq., commander, ran aground on this shoal, on the 20th of August, 1821, having, at the time, Araya Point bearing S. E. by E., by compass, distant 6 miles, by estimation. Subjoined is an extract from the log book, whence we have obtained the information:—

"P. M. Fresh breezes and fine, running along the land between Margarita and the main. At 4h. Point Araya south, 6 or 7 miles: at 4h. 15m. trimmed sail and hauled more to the wind; at 4h. 25m. the ship under a press of sail, running at the rate of 10 knots, S. S. W., by compass, being about 6 miles from Point Araya, and (by the leadsman in both chains) in 9 fathoms water, suddenly shoaled, and immediately afterwards struck the ground. Shortened and furled sails; hoisted out the boats, and sounded in every direction round the ship; laid the stream anchor out N. W., in 3 fathoms; at 6h. parted the stream cable, of which 90 fathoms were lost: Point Araya then bearing S. E. by E."

It farther appears that the sea broke very high within a quarter of a mile of her; and that the soundings all round were very irregular. On the 23d, after being lightened, she got off.

ward with the coast, narrowing by degrees to the vicinity of Mont Blanco, where it terminates on a clean shore.

The edge of the bank that runs southward from the point is very close to the shore, forming with it the mouth of the River Manzanares, or Cumana, whence it increases in breadth to the S. W. so much that, N. W. of the Escarpado Roxo, a little mount, with a red cliff, south of the town, it reaches about a mile from the shore; from this point it narrows again, and terminates at Point Piedras.

The TOWN and FORT of CUMANA, stand on the high land of the point, on the banks of the Manzanares, or Cumana River: on the low land, and near to the beach, stands an Indian town, separated from Cumana by the river. The anchorage is nearly in front of, or to the westward of, the river's mouth, on the south point of which is another fort. In order to fetch this anchorage, ships should steer from Point Caney towards Escarpado Roxo, but not more to windward, until the Bank off Punta de Arenas is cleared. Having passed it, they should keep to the wind, and steer direct for the mouth of the river, which will be known by the fort already spoken of. Keep the lead going; and on getting a depth of water suitable for the size of the vessel, let go an anchor, with which, and a stream anchor towards the shore, the ship will be moored.* If, from a scant wind, or from the current having set the vessel to leeward, it should be necessary to work to windward to gain the anchorage, when standing to the southward she should tack before Fort St. Antonio, which is situated on the most elevated part of the town of Cumana, bears to the northward of east, in order to keep clear of the projecting point of the bank off Escarpado Roxo; to the northward there is no danger, and the board may be prolonged according to judgment.

To the S. W. of the Escarpado Roxo, and a little to the eastward of Punta de Piedras, the River Bordones disembogues its waters; and from this latter point the coast lies nearly west for the distance of 3½ miles, in some parts scarped, and in others a sandy beach, to Port Escondido, which is a bay running about a half a mile inland, and 3 cables' length wide at the entrance. In the middle of it the depth is 4½ fathoms, on sand, but nearer to the shore, only 3 and 2. Off the West Point there are some rocks, which may be avoided by passing a little more than a cable's length from it.

From the West Point of Port Escondido the coast trends about west for the distance of 1¼ mile, to Punta de Campanarito, all of which is scarped, and very clean, except one sunken rock, about half a cable's length from the coast, and 2 or 3 cables' length to the westward of the West Point of Port Escondido.

From Point Campanarito to the Morro and Vigia, or Signal Tower of Mochima, the distance is ¾ of a mile: between them is a very fine bay, varying in depth of water, from 16 fathoms to 5½, which will be found within a cable's length of the shore. Every part of the bay is clean; and only off the north and west sides of Point Campanarita there are a *few rocks*, extending somewhat less than half a cable's length from it, but, nevertheless, it ought not to be passed nearer than one.

About W. S. W. from the Signal Tower of Mochima, a little tongue of land projects and forms the east point of the Harbor of Mochima, which is capacious, beautiful and well sheltered. The shores are indented with several coves, or little bays, which are so many natural docks. The depth of water is very regular, no where exceeding 14 fathoms, or being less than 4½; the latter from one to one cable and a half's length from the shores, which are generally very clean. By keeping at the distance of 1½ cable's length from every visible obstruction, all danger will be avoided. To these good qualities may be added that of sailing in and out with the trade wind,† altogether making it the best harbor in this part of America; indeed it may be reckoned one of the best in the world,

* His Majesty's ship Valorous, Capt. J. Murray, anchored here, in February, 1821, at about 2½ or 3 cables' length from the shore, in 14 fathoms water, on mud and clay, with the low sandy point at the entrance of the river bearing N. ¾ E., by compass, distant 3 cables' length; and Fort San Antonio, on the hill above the town, east. The bank shelves off very suddenly, which occasions vessels to anchor near the beach, in 14, 8, and 6 fathoms, on good ground. To the northward, and off the *fort* on the beach, it shelves off quicker still; but to the southward, the shoal water extends farther off shore. The Bellette sloop, J. Smith, Esq., commander, in March, 1825, anchored in 20 fathoms, on mud, with the *castle* on the hill and *church* in one, E. ½ N., by compass: the fort on the beach N. N. E. ½ E., and the Red Cliff (Escarpado Roxo) S. ½ E. This is about ¾ of a mile off shore, and is quite an outside berth; it is necessary to steady the ship with a stream to the S. W. The rise and fall of the tide is from 4 to 5 feet. Good water may be obtained in the little river to the northward of the fort on the beach. The wind always blows off the shore.

† His Majesty's sloop Sapphire, A. Montgomerie, Esq., commander, visited this harbor in April, 1821. Capt. M. observes, that though the anchorage is good throughout, the most secure is in either the two first eastern bights, mooring with a cable or hawser to the shore. The harbor may be entered with the trade wind; and as there is generally a land breeze during the night, it is easy of egress; though from the first eastern bight, a ship may sail out at any time with the sea breeze. Water may be obtained at the south end of the harbor, from the River Mochima, though it by no means deserves that appellation, being only a small stream at any time; and though, if cleared a little above its mouth, enough might be had for any number of ships, yet it can at no time be accounted a good watering place.

About a mile to the westward is the Harbor of Manare, which is also an excellent port. The depth of water is from 14 to 4½ fathoms, the latter at half a cable's length from the shore. It is very clean, and as the entrance is spacious, it may be entered with the trade wind at any time, and quitted with equal facility. The west point of the harbor is called Point Manare.

From Point Manare the coast runs about W. S. W. for the distance of 1½ mile, to Punta de Tigrillo, which sends out a reef on every side, to the distance of half a cable's length from it. The coast thence trends to the southward and eastward, a distance of 2½ miles, whence it returns to W. by S. for 5 miles, to Punta Gorda, forming what is called Tigrillo Bay, at the farther extremity of which there is a canal communicating with the Harbor of Mochima. In the entrance of this bay there are three islands: the first or easternmost one is named Venados; the second or middle one the East Caraca; and the third the West Caraca. The shores of the bay, as well as those of the islands, are very clean, there being only off the north point of Venados, called Point Campanario, a rock which extends about a cable's length from it; and from the S. W. part of the same island, a small shallow bank running off a considerable distance. All the passages or straits between these islands, and also between them and the main land, are free and navigable for ships of any class; and although some of them are narrow, there is sufficient room for anchoring, in case of necessity.

The only danger to be avoided is a rocky shoal, called the Caracas, which lies about N. W., at the distance of rather more than a mile from the East Caraca. It is about half a mile in extent from east to west. There is not, however, much risk; for in passing between it and the Caracas, it will be avoided by keeping near to the latter, and in going outside of it, keeping to the northward of Point Manare will clear it in that direction.

To the southward of Punta Gorda, distant 3 miles, lies Punta del Escarpado Roxo, (Red Slope Point.) These form the entrance of the Gulf of Santa Fé, which runs about 6 miles inland to the eastward. All its shores are very clean; but at the entrance, at about one-third of a mile from the north coast, lies a foul rock, that should not be approached within two cables' length. The depth of water in this gulf is from 27 to 18 fathoms, on mud bottom.

From the Point of Escarpado Roxo the coast inclines to the southward, and then to the westward, for 2½ miles, to Punta de la Cruz, forming a bay that is very clean, and affords excellent anchorage, called the Bay of Santa Cruz. About W. S. W., one mile from the latter point, lies the easternmost of the little islands called the Arapos, extending altogether to the westward about half a mile. They are very clean, except in the strait between them, which is impassable on account of a bank and reef that unites them together. The passage between the easternmost one and the coast is open, and without danger. Off the western part of the westernmost island there are two rocks, but they are very clean.

From Punta de Cruz the coast continues westward, inclining a little to the southward, nearly 4 miles, to Punta Comona; the whole of it clean, and navigable within two cables' length of the shore, without the least risk. Westward from Punta Comona, almost two miles, is Punta de Pertigalete, in which space there is a fine bay, with 12 fathoms water within a cable's length of the shore. In the farther part of this bay there is a sandy beach, where two small rivers discharge their waters. It is all very clean, except on the eastern part, which sends off a reef about a cable's length from the shore.

MONOS ISLAND.—In front of this bay, and about 3 cables' length to the northward of Pertigalete Point, lies the south coast of the Island Monos, or Guaracaro, the shores of which are steep and clean. About 2 cables' length from the north side there is a rock and a foul reef, which should not be approached nearer than half a cable's length; the channel between Monos and the rock is very clean, with 25 fathoms water, and in sailing through it will be best to keep closer to the island than to the rock. The channel between Monos and the coast is also very clean, with 45 to 50 fathoms water in the middle of it, and nearly the same depth near to the island, which should be kept close on board, if any thing prevents running through mid-channel.

One mile and a half to the westward of Pertigalete Point is Point Guanta, and between them is formed the Bay of Pertigalete, within which there are several islets, and a little river disembogues into it. In case of anchoring here, it will be necessary to keep clear of the west side of Pertigalete Point, passing it at a cable's length at least, to avoid a reef which runs out from that part. It is also necessary to be careful to avoid a reef and shoal from the centre of the bay; which will be cleared by not getting any thing to the westward of the most easterly part of the first islet to the north. With this attention a ship may be anchored nearly north from the mouth of the little river, in 4½ fathoms water, at about 1½ cable's length from the beach on the east side.

To the westward of Punta de Guanta, and 3 miles distant, is Punta de Bergantin: between the two, and about a mile from the first, is the little bay of Guanta, in the mouth of which lie several islets and rocks, with very narrow channels between them, though

very clean and navigable. Within the bay there are from 15 to 9 fathoms water, at half a cable's length from the shore: at the west front of the bay a reef runs off about 2 cables' length; but, by keeping over to the eastern side, which is very clean, every difficulty will be avoided.

THE PUNTA DEL BERGANTIN has a foul reef, which runs off about a cable's length, and extends about a mile to the southward. On the S. W. side of the point there is an islet, so very foul all round as not to leave a clear passage between it and the point, from which the coast continues west, forming Bergantin Bay, the southern side of which has a foul reef that borders the coast westward as far as the Morro of Barcelona. This Morro has high land, lying nearly north and south one mile in extent, and joined to the main land by a very narrow isthmus, or tongue of sand, rather more than a mile in length.

The distance between Punta del Bergantin and the Morro of Barcelona is 4¾ miles, and the coast inclines to the southward, forming a large bay called Pozuelos Bay: all this tract of shore, which is a sandy beach and very low land, sends off a shallow bank a mile into the sea. Therefore, in navigating on this part of the coast, it is advisable to steer directly from Bergantin Point for the north point of the Morro, which is steep and clean, and may be passed within a cable's length; or, should it be thought preferable to go into the bay, the lead must be kept going, to avoid getting into less than 7½ fathoms water, sandy bottom.

The western side of the Morro of Barcelona is foul, and ought not to be approached nearer than 2 cables' length: from its north point to Punta Maurica, which is to the southward of it, the distance is about 4 miles: the coast, a low sandy beach, rounds in to the eastward; and in this part the River of Barcelona, discharging itself into the sea, forms a large bank of sandy mud. About 1½ mile inland, on the left bank of the river, stands the city of Barcelona. To anchor in the bay, the lead will prove the best guide, for being very shoal, each ship may take a berth suitable to its draft of water.

On the coast from Cape Manare, besides the Caraca Islands, already noticed, there are several others, called the Picudas, the Chimanas, and the Borracha. The Great Picuda lies to the westward of the West Caraca, with which it forms a channel rather more than a mile wide, free from all danger, except a sunken rock that lies about 2 cables' length to the eastward of the east point of Picuda. This island lies about S. W. and N. E., and is little more than a mile in length: its shores are very clean: to the northward of its east extremity there are two rocks—the first about one, and the other three cables' length off. About S. W. by W. from the Great Picuda, at the distance of 3¾ miles, lies the second Picuda—an islet of a circular figure, about 3 cables' length in extent, and very clean. About S. S. E. from it, at the distance of a mile, is the east Chimana, another islet less than the preceding, and equally clean. Two miles further west is the east point of the second Chimana, which lies east and west, about 1⅓ mile in length, and also very clean; to the eastward of it are two little islets, the nearest being about one cable's length off, and the other 5 cables; and on the west side is another little islet about a cable's length distant. About S. W., 2 cables' length from the west point of the second Chimana, lies the east point of the Great Chimana, which island is of a very irregular figure, and in its greatest extent, about E. by S. and W. by N., 3½ miles. To the westward of it, about one-third of a mile, lies the West Chimana, joined to the Great Chimana by a shoal of rocks and sand, extending a full half mile to the northward of the north extremity of the Great Chimana; on this shoal, and midway between the two islands, there is an islet; also another at a short distance from the west extremity of the West Chimana; and, finally, to the southward of the east part of the Great Chimana lies the South Chimana; that, in its greatest extent from N. E. to S. W., measures two miles. This island forms two channels; one on the north with the Great Chimana, about a cable and a half wide, and very clean, with a depth of 20 fathoms, on mud; and the other to the south, between the island and Punta del Bergantin, half a mile wide, and very clean; in passing through it the reef, which extends about a cable's length from Bergantin Point, is the only danger to be avoided. Between the Great and the South Chimana, there are several islets, all very clean.

From a recapitulation of what has been said of the Picudas and Chimanas, it appears that these islands and their islets are clean and steep to; the only dangers being the rock on the east of the Great Picuda, and the shoal in the channel between the Great and the West Chimana; consequently, all the channels or passages between these islands and their islets are navigable, although some of them, from being very narrow, are not so eligible for large ships: this circumstance, however, is a matter of choice for the navigator; in other respects he has no hidden danger to guard against.

BORRACHA ISLAND, (Drunken Woman's Island,) is about 3 miles to the westward of the West Chimana: it lies nearly north and south, in which direction it is rather more than 2 miles in length, and 1¼ at its greatest breadth. All the east and north sides of it are clean; but, on the N. W., a very foul rocky bank, with very little water on it, extends to a considerable distance, having on it several little islets: all of which should

be passed on the outside, at 2 cables' length distance from the most westerly. From the south extremity of the island a large sand bank runs off about S. S. W., on which are situated an islet, called Borracha; near the island, two small islets, called the Borrachitos, at the distance of two large miles from the Borracha. They should always be passed on the south side, at the distance of 3 cables length from the southernmost of them; for, between them and the Borracha, as well as between it and the principal island, the water is very shallow.

From the anchorage of Barcelona the coast trends to the S. W. and westward, for the space of 32 miles, to the Morro of Unare, which lies about W. S. W. ¾ W., 34 miles from the Morro of Barcelona. It thence inclines to the northward of west, then N. W.; and lastly, north to Cape Codera, distant from the Morro of Unare 57 miles N. W. by W. ¾ W., and from that of Barcelona, 85 miles N. 76° W.

The whole of this coast is low land, on which are seen the Morros of Piritu and of Unare, distant 7 miles from each other. The water is shallow along it, but it is very clean, and in approaching it the lead will be a sufficient guide. The two islands of Piritu lie nearly 12 miles to the westward of the anchorage of Barcelona, and about 3¼ miles from the shore: they lie nearly E. S. E. and W. N. W., are low like the coast, and have a reef extending a cable and a half's length from them. There is a passage between the two islands, but it is hazardous to attempt, on account of the reefs on each side, which leave a channel of only 2 cables' length wide, with 5½ fathoms water. The passage between the islands and the main land is free for ships of any size; and in going through it there is no necessity for any other guide than the lead.

About due north from the Morro of Roldar, at the N. W. point of Margarita, about 40 miles, lies the southernmost of seven islets, called the Hermanos, or Brothers; which southernmost, at the distance of 2 miles therefrom, is called Pico; and from it to the next, which is the largest, and called Orquilla, the distance is 3 miles; the others lie to the north and N. N. W. of it: they are all very clean and steep to; so that there are no soundings in the passages between them.

BLANCA.—To the westward of the northernmost of the Hermanos, at the distance of 7½ miles, lies the Island Blanca,* or Blanquilla, about 6 miles in extent from north to south, and 3 from east to west: it is very flat and sterile, and the coasts are very clean, except the S. W. point, where there are several ridges of rocks extending about 3 cables' length from the shore; some parts of the west side, and off the north point, where there are some foul rocks extending 2 cables from the shore. On the N. W. part there is an anchorage, in from 18 fathoms at a mile from the shore, to 6 or 7 at 3 cables' length from it; all the bottom being sand. On the west side, about half way, at a cove in the beach, there is a Cazimba, spring, or well, where fresh water may be obtained.

TORTUGA.—Westward from Margarita, at the distance of 47 miles, lies the east end of the Island Tortuga, (Turtle Island,) which thence extends about 12 miles to the westward, and is about 5 miles at its greatest breadth. All the east and N. E. sides are very clear, except at Punta Delgada, the N. E. extremity, where a reef extends off about 2 cables' length: the south side is also clean; but, at the S. E. part are several islets. The west point of the island is named Punta de Arenas, from which to the north point, called Punta Norte, there are so many banks, that it will be necessary to keep the lead going while passing that space. On this side there is, first, Anguila Key, lying about half a mile from the shore, the intermediate channel being very foul with reefs; second, Cayo Herradura, or Horse-shoe Key, forming, with the coast, a channel of one mile wide, but too dangerous to be attempted by large ships; from the N. E. point of this key, a ridge of rocks extends about 2½ cables' length eastward; thirdly, the Tortuguillos Keys, two in number, entirely surrounded by a bank, with little water on it. The anchorage at this island is between the Tortuguillos and its coast: it may be entered from the S. W., or from the north, through the channel formed by the Tortuguillos and Herradura Key. At the anchorage, and in all the channels, the greatest depth of water is from 6¼ to 7¼ fathoms, with sandy bottom in the middle. In going in the only care required is not to go into a less depth than 6¼ fathoms.

Description of the Coast af Caracas and the Frontier Islands, from Cape Codera to Cape St. Roman.

CAPE CODERA, a place well known on this coast, is a very round morro, or hill, to the north of which, about a mile, a tongue of low land projects, and is so clean that at half a cable's length from it there are 9 fathoms water, on sandy bottom. On the west side this tongue forms a very fine anchorage, named Puerto Corsarios, or Privateer's Bay;

* Mr. W. Waddy, master of His Majesty's Ship L'Aimable, in his remark says, "This island appears low, with white cliffs. You may sail round it without the least danger, and may anchor in the depth of 8 or 9 fathoms, in Dampier's Bay, having the S. W. point of the island bearing N. ½ E., about the distance of a mile: the ground is a white sandy ooze. The current sets regular from E. to west."—March 9, 1796.

to enter which it is only necessary to double the west point of the tongue, close to which there is a farallon, or rock, and anchor so soon as there is shelter from the wind, wherever the depth of water may be suitable; with an understanding, that at two cables' length from the shore there are 7 fathoms water, on sandy bottom. At the south extremity of the bay, the coast, for a space of about 3 cables' length, is a low swampy beach, to the westward of which it is foul, with a reef stretching about half a cable's length from the shore. The west point of the bay, named Caracoles, has on the north side a rock close to it, from which a reef extends about a cable's length.

From Cape Codera the high mountains of Caracas are visible, extending east and west many leagues. Nearly 14 miles N. $\frac{3}{4}$ W. from the cape, lies an islet, which appears like a ship under sail: it is very clean, except about a musket shot to the north, where there are two sunken rocks, having between them and the islet a channel of great depth.

From Point Caracoles the coast runs in the direction of W. N. W., a distance of $9\frac{1}{2}$ miles, to Point Maspa, whence it trends W. by S. $2\frac{1}{2}$ miles, to Point Chuspa, which is the eastern extremity of an anchorage of the same name. All this space is bordered by a reef, which extends one mile northward from Point Maspa, and terminates at Point Chuspa; for this reason it should not be coasted at a less distance than 2 miles.

The anchorage of Chuspa is excellent: from the Point Chuspa, which is the N. E. point of the bay, the coast runs about S. W. for a mile and a half, to the mouth of the River Chuspa, on the east bank of which stands the town of Chuspa, about 2 cables' length from the beach.

From the mouth of the river the coast rounds to the westward for the distance of $1\frac{1}{2}$ mile, to Point Curuau; to the southward of which, at about one-third of a mile inland, stands the town of Curuau. From Point Chuspa to that of Curuau the shore is very clean, and the only guide required for entering the anchorage will be the lead; but, from Point Curuau the coast is very foul, with a reef extending 2 cables' off, and continuing so to La Punta del Frayle, (Friar's Point,) with a farallon, or rock, of the same name, about a cable's length from it. This point is nearly 4 miles from Point Curuau; between the two points there is a projection to the north, called de Sabana; and to the north of it lies a bank, the south edge of which is about a mile from the shore: its greatest extent is about a mile from S. E. to N. W., on rocky bottom; and, although the general depth on it is from 8 to $4\frac{1}{2}$ fathoms, in some places there are only $3\frac{1}{2}$, and even less than 3; for which reason it should be carefully avoided. It lies 3 miles from the anchorage of Chuspa; and, as in fetching that place it will be necessary to pass near to Point Chuspa, there can be but little risk in approaching it; it will, however, be entirely cleared, by taking care to be to the northward of the parallel of Point Chuspa, before crossing the meridian of Curuau.

From Point del Frayle the direction of the coast is S. 86° W., for the distance of $29\frac{1}{2}$ miles to the anchorage of La Guayra,* on every part of which a ship may be anchored at half a mile, or even at a musket shot's distance, from the shore.

THE PORT OF LA GUAYRA, with respect to its commerce, is the principal one on this coast: it cannot properly be called either a harbor or a roadstead, but a continued coast, with a little sinuosity between Point Carabellera on the east, and Cape Blanco in the west; consequently, it affords no shelter from winds in the N. E. and N. W. quarters; and the trade wind from the eastward, which constantly prevails, sends in a heavy sea. To prevent ships from thwarting the sea when the wind subsides, or falls calm, they are generally moored with a cable astern to the westward: the bottom is good holding ground, and at a cable's length from the shore there are nearly 3 fathoms water. In this anchorage, it is seldom that any other wind than the trade is experienced, which, however, sometimes, for short intervals, does veer to the west; in which case, the position of the ship should be changed, and her head placed to the westward: there are seldom any land winds, but there are squalls from the S. E., during the rainy season. Although, from the nature of its locality, La Guayra cannot be considered as a port or an anchorage, yet, from the nature of the climate, it is both, in which with fresh, or indeed with hard gales, ships at anchor are not exposed to danger.† Ships from sea, bound to

* About 3 miles to the eastward of La Guayra, is the little village of Macuto, situated in a small bay of that name, and is an excellent place for watering. The water is procured from three iron pipes, or spouts, distant about 84 feet from the beach. There is good anchorage all over the bay, and the soundings are very regular in approaching the watering place. On going in towards the village, keep the watering place in a line with the N. W. corner of the chapel, and the highest cocoa-nut tree, over the east angle of the fort west of the village.

There is a depth of 20 fathoms at about three-quarters of a mile from the shore, with a street of the village, close by the watering place, open, or end on; and the easternmost point about a sail's breadth open of the point to the westward of it. Remark book of H. M. S. Salisbury, Captain John Wilson, 1819.

† Captain F. Chamir says, "La Guayra cannot be called any thing else than a dangerous roadstead; but, as the trade wind blows right along shore, by being prepared, a ship may always clear

the anchorage of Laguayra, will have a good mark in a very high and steep peak, called the Peak of Cares, situated about 9 miles inland, and 20 miles to the eastward of the anchorage. At about 10 miles to the westward of this peak is another, called the Peak of Niguatar; and thence a range of mountains extending towards Laguayra, among which the Silla de Caracas, (Saddle of Caracas,) and Mount Avila, may be very well distinguished; the latter being about 2 miles inland, and nearly on the meridian of the anchorage. It is advisable to make the land well to windward; there will then be no danger in running down to the anchorage. Cables are sometimes injured here by some anchors lost by the English in one of their expeditions against this place.

From the anchorage of Laguayra the coast first runs west for the distance of six miles, and thence west by south twenty and a half miles, to the little harbor of Cruz, and is sufficiently clean to be run down at the distance of a mile. This port is a small indent in the coast, with an entrance about one and a half cable's length wide, and two cables in extent inward; very clean; for at half a ship's length from the coast, all round, there are four and a half fathoms water. At its south extremity a little river discharges its waters; and off its eastern point, called Point la Cruz, there is a rock close to it. Were it of greater capacity, this anchorage would be excellent; but it is so small as to be eligible for small vessels only.

From Point la Cruz the coast trends S. 82° W., a distance of 23 miles, to the Bay of Cata. It is all very clean, and may be approached with safety to the distance of a mile, or less. About 2 leagues to the eastward of this bay, and 5 miles inland, will be seen Monte de la Meseta, (Table Mountain,) and at about the same distance inland, on the meridian of Cata, another, called Mount Ocumare. These will serve as marks for taking Cata Bay, or the anchorage of Ocumare, which is farther to the westward.

Cata Bay is half a mile wide at the entrance, and about as much in depth. At the eastern point there is an islet lying almost close to it; and from this point the shore trends to the south to the extremity of the bay, where a river falls into it, throwing up a bank, with little water on it, which extends almost a cable's length from the shore. Every other part of the bay is clean, with a depth of water from 25 to 4½ fathoms, about 1½ cable's length from the beach.

Two thirds of a mile westward from the west point of Cata Bay, is the eastern point of the Bay of Ocumare, in which there is very good anchorage. An islet lies off the east point, in a N. W. direction, forming with it a strait, or channel, of about half a cable's length wide, very clean, and with a depth not less than 6 fathoms. In taking the anchorage in this bay, pass close to the islet, and steer to the south until shelter is obtained from the wind; then anchor in 6 or 6½ fathoms, on sand, at about a cable's length, or a little more, southward of the islet. The bay has many banks in it, but the lead is a good guide. Care must however be taken; for as the anchorage narrows to the southward, a large ship may possibly touch the ground, unless attention be paid to luff, and stop her headway in time. A river falls into this bay to the southward of the islet, having on its banks a few fishermen's huts.

Two miles and a half westward from the islet of Ocumare, lies the east point of a bay, called Cienega de Ocumare, (the Bog or Quagmire of Ocumare,) which is, in fact, no more than a swampy opening in the land, and which, between shoals of a reef, has a channel of 12 to 4½ fathoms water. The west point of this bay is formed by an isolated morro that rises on the low land. The anchorage is very bad, and fit only for small coasting vessels.

One mile and a half to the westward of the Morro of Cienega, is the Harbor of Turiamo, which is excellent, and capable of receiving every class of ships. At the exterior points it is about a mile broad, but decreases inwards to two-thirds of a mile. From the entrance to its south extremity, is about two miles, and the general depth, in mid-channel, is from 25 to 18 fathoms, on mud and sand. All its shores are bordered by a reef, extending off about one-third of a cable: therefore, by not approaching nearer than half a cable's length, all danger will be avoided. At the farther extremity of the harbor the river Turiamo discharges itself on a sandy beach. Off the east point, at a cable's length in a N. W. direction, lies Turiamo Islet.

From the harbor of Turiamo, westward, at the distance of 9 miles, is Porto Cabello. This part of the shore is very clean, and may be coasted at the distance of a mile.

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the land. The town and fortifications, which may be distinguished at a long distance, mark the anchorage; the former bearing S. by E., in a depth of 10 fathoms, at 1½ mile from the shore, is as secure as any other. The Rollers are very heavy, and oftentimes it is dangerous to attempt landing. The ground is very bad for holding, and in a good strong sea breeze you may expect to bring your anchors home."

Capt. G. G. Lennock, in his remarks on this place, observes that, "although during the hurricane of 1815, at the Leeward Islands, they did not experience any wind here, yet there was a very heavy swell at the anchorage, which drove the vessels from their anchors on shore, and dashed them to pieces against the rocks."

There are various detached islands lying off it to the eastward of Porto Cabello; and for sailing by or between them, sufficient information will be obtained by inspecting the Plan of the Port, published at the Hydrographical Office, which includes all these islands.*

Porto Cabello is a channel formed by several islets and tongues of low land, covered with mangroves. Ships desirous of entering must be warped into it; and those of the largest size may be made fast to the mole, not requiring even the use of a plank to land from them. The mouth of this channel opens into a spacious bay, with excellent anchorage, in 10 to 12 fathoms, sandy mud, and well sheltered from the trade wind. Being in 4½ fathoms, will be near enough to the beach, which is rocky and foul. The best berth is about west from the harbor's mouth, at the distance of 3 or 4 cables' length, in 11 or 12 fathoms. In this harbor, all Spanish merchant ships that go to Laguayra, are careened, and winter. Each ship, so soon as she has delivered her cargo at Laguayra, proceeds to Porto Cabello for greater security, to receive such repairs as may be necessary, and take in part of the homeward bound cargo. She then returns to Laguayra to complete her lading. At Porto Cabello there is always a body of good shipwrights, &c., although it is not very numerous. Ships of war should only enter the harbor when it may be necessary to careen them; for other purposes it is not only useless, but it is prejudicial. They should, therefore, always remain in the bay; for the excessive heat in the harbor, the mangroves with which it is surrounded, added to any degree of intemperance, occasion almost immediate attacks of putrid fevers and the black vomit, both of which are very fatal to Europeans.

The coast to leeward, or to the westward of Porto Cabello, forms a great bay, called Tucacas, or the Gulf of Triste, (Doleful, or Dreary Gulf,) in which there are several islets. With the trade wind it is a lee shore, and rather dangerous. Ships from Europe should keep clear of it, as there can be no inducement to take them in. Point Tucacas, the north point of this gulf, bears N. 28° W., 25 miles from the mouth of Porto Cabello: therefore, vessels bound westward from that port should steer about N. by W., until they are abreast of Point Tucacas, or N. N. W. if they intend to keep close in with the point, in order to take the anchorage at it, called Chichiriviche.

Point Tucacas is formed by a low swampy land, covered with mangroves, which projects out from the high land about a mile. On the east side of it there is a key, about a mile in length from S. E. to N. W., called Sombrero, between which and the coast there is a channel barely half a mile wide; and, although there are 11 fathoms water in it, it is dangerous from shoals, and the reefs extending from the coast. A key on the N. E. side of it is also surrounded by a reef of two cables' breadth, which should not be approached at less than a mile distant. From Point Tucacas, which is to the westward of the most northerly part of Sombrero Key, the coast runs about N. W. It is low and foul, with a reef half a mile broad, which extends so far as the mouth of the harbor of Chichiriviche, distant 3 miles from the point. This harbor is formed by low lands covered with mangroves; and, although well sheltered from all winds, with 6½ fathoms, good holding ground, the entrance to it is a little difficult on account of shoals and reefs. The east point, called Chichiriviche, presents a front of rather more than a mile in length, from which a reef runs off about three cables' length, having on it several islets that must be passed on the outside. To the north of these there is a key, called Peraza, with a foul reef all around it, half a cable broad. This key, and the islands off the point, form a channel two cables' length wide, with upwards of 7 fathoms water. To the westward of Peraza Key lies another, called Chichiriviche Key, larger than the former, and also surrounded by a reef of a cable's length broad. Between these two there is a channel rather more than two cables' length wide, with 6 and 7 fathoms water in it. To the west of Chichiriviche Key lies the west point of the harbor, forming between them a channel of 2½ cables' length wide, with 5½, 6, and 7½ fathoms. There are, however, two shoals in it, with only 2 fathoms water over them. At half a mile north from Chichiriviche Key, there is a large one, called Salt Key, from the salterns in it. This key is also surrounded by a reef, nearly a cable's length broad, except on the S. W. part. Finally,

* It appears, by the remarks of Captain James Murray, of H. M. Ship Valorous, that there is a very good and spacious anchorage between Isla Larga, or Long Island, and the main, and about 3½ miles to windward of Porto Cabello. There is plenty of room for a large fleet, in 10 or 12 fathoms water. You may sail into, or out from, this anchorage, through between any of the islands; but the best passage is considered to be round the east end of Long Island, between it and the main, in order to take a berth well to windward.

The Valorous anchored here on February 27, 1823, in eleven fathoms, with the S. W. end of Long Island bearing N. N. W., by compass, distant two cables' length; the east end of the island east, and the fort on the hill above Porto Cabello, W. S. W., distant 3 or 4 miles. This is a very good place to get wood; and fresh water may be procured from the river on the main a little to leeward.

It is necessary to be cautious of a shoal that lies about a cable's length to the southward of the west end of Long Island.

about N. by E., at the distance of 1½ mile from Salt Key, lies Borracho Key, which is very foul, with a reef extending half a mile from the N. E. and S. points of it. All this part of the sea just described is of so regular a bottom, that at somewhat more than one half a mile from the coast there are 6½ fathoms, which depth continues so far as 2 miles north of Borracho Key, where there are 14 fathoms, on sandy mud. To enter this harbor, observe that on getting abreast of the northernmost part of Sombrero Key, which should always be passed on its outside, place the ship's head towards Peraza Key, and on approaching it steer west, so as to pass in the middle of the strait between it and the islets off the point, until Peraza Key bears N. E. by E., and then S. W. by W., edging towards the south, so soon as the largest islet off Point Chichiriviche bears east; thence run under shelter of the point, luffing up to S. S. E., and there anchor in 6½ fathoms, mud. The plan of this harbor will show all that is necessary to be done, either in going in or coming out.

From the Harbor of Chichiriviche the direction of the coast is N. N. W. ¾ W., for the distance of 18 miles, to Point St. Juan; the ground in all that tract is so regular, that at the distance of 4 miles, there are only 14 fathoms water: the only danger is a small *shoal*, called La Piragua, lying off a little point, named Manatie, about four and a quarter miles before arriving at Point St. Juan: it does not, however, extend more than a mile from the shore.

Point St. Juan forms, on its west side, a large bay, but so shallow, that at a mile from the beach, there are no more than 3½ fathoms water. N. W. of the point there are two keys; the first, half a mile distant, called St. Juan's Key; and the second, nearly 2 miles farther, named the N. W. Key. On the N. W. side of Point St. Juan, a reef stretches off about 2 cables' length; and the Key of St. Juan is surrounded by another about half that breadth. The N. W. Key is also surrounded by a *reef* that extends out about half a mile from its S. E. point, having on it several keys and islets. The anchorage is to the S. W. of St. Juan's Key: in order to take it, it will be necessary to pass to the northward and westward of that key, and anchor in any depth of water suitable to the ship's draught. It is directed to pass outside of St. Juan's Key, because the channel formed between it and the point is eligible for small vessels only; not alone from its narrowness and the foulness of the reef, but because the greatest depth of water is only 3¼ fathoms.

From Point St. Juan the direction of the coast is about N. 60° W., for the distance of 19 miles, to Point Ubero, the whole space being clean, and the depths regular; but there is a farallon, or rock, lying near a rocky, or cliffy part of the shore, about 8 miles from Point St. Juan, called Penon del Soldado. On the west side of Point Ubero there is a bay, but being very shallow, it scarcely affords any shelter for large ships from the trade wind. About N. N. W., one and a half mile from this point, there is a *bank*, over which the least depth is four and a half fathoms: on it there are some *loose rocks*.

From Point Ubero to that of Zamuro the distance is 12 miles N. W. by W.; and from Point Zamuro the coast runs N. 77° W., forming various sinuosities, for the distance of 25 and a half miles, to Point Manzanilla; and thence S. 83° W., 14 miles, to Point Taymatayma. All this coast is clean, and the soundings regular, requiring no other guide than the lead to run along it at half a league distance; and in the interior are several heights that may be seen far at sea. Between the Points Manzanilla and Taymatayma the coast bends in to the southward; and at the distance of 5 miles S. 62° W. from the former, is the Bay of Cumarebo, being a sandy beach, so called; the town of the same name standing on a hill at the distance of 3 miles S. E. from it. N. N. W., 6½ miles from the sandy beach, and N. 65° W., 7½ miles from Point Manzanilla, lies the rocky bank of Cumarebo, with 5½ fathoms water on it, and from 11 to 18 fathoms very near to it. From Point Taymatayma the coast trends S. W. by W., about 4 miles, to Point des Frayles, on the east side of the Bay of La Vela de Coro. This bay has an anchorage, and, in proceeding to it, no other guide than the lead is required, as the bottom is regular and clean. At the S. E. part of the bay stands the town of La Vela de Coro; and about two miles inland to the eastward of it, an Indian village, called Carrizal. The River Coro falls into the sea 1½ mile west of the town.

From the River Coro the coast turns abruptly to N. W. ¾ N., forming a chain of sand hills about 19 miles in length, uniting the Peninsula of Paraguana with the coast; these sand hills are called the Isthmus of Medanos, or Sand Hills. The Eastern Coast of this Peninsula trends true north for 15 miles, to Point Auricula, which bears N. 24° W. from the Bay of Coro, and distant 33 miles: all the coast has very regular soundings, there being 18 fathoms at the distance of 10 miles from it.

From Point Auricula the coast trends from N. by W. to N. W. ½ N., a distance of 16½ miles, to Point Tumatey; and thence about W. N. W., 3½ miles, to Cape San Roman, the northernmost land of the Peninsula. The mountain of Santa Anna, on the Peninsula Paraguana, may be seen from the sea at the distance of many leagues.

Due north from Cape Codera, at the distance of 23½ leagues, lies the Island of Orchila, rather flat; its greatest extent is from east to west. On its north coast are some peaks, the highest of which is at its western extremity. Off the east end a key runs to the north-

ward about 3 miles; and to the westward of it, a great *reef* extends in that direction, nearly half the length of the island: there are several keys on the reef. All the rest of the coast is clean, and may be approached to a cable's length. On the S. W. part, near the western extremity, there is a very clean sandy beach, in front of which there is a good anchorage, well sheltered from the trade wind, in 6 and 7 fathoms water, within a cable and a half of the beach. Half a mile W. N. W. from the west point of the island, there is a high rock, very clean and steep, forming a passage eligible for ships of any burthen.

S. W. $\frac{1}{4}$ W. from Orchila, and S. E. by E. $\frac{3}{4}$ E. from the east end of the Roccas, there is a shoal with 3 fathoms water; the form of the shoal is nearly round, and is about $1\frac{1}{2}$ mile round. Long. corrected by the Roccas, 66° 27′, lat. 11° 42′.

The ROQUES.—Twenty-two miles to the westward of Orchila lie the Roques, an assemblage of low keys raised on a very dangerous reef. This group occupies a space of 12 miles from north to south, and 23 from east to west; of which the S. E. Key, named Grande, is 6 miles from east to west, and nearly the same in breadth. To the westward of it is Key Sal, upwards of seven miles in length, nearly east and west, very narrow; and to the northward and westward of Key Sal, there lie a great number of smaller ones, without any passage between them. The northernmost group consists of El Roque, nearly two miles in length, E. by S. and W. by N., the French Keys, four in number; the N. E. Key, Naman's Key, and Pirate Key. All the exterior keys on the edge of the reef may be passed at a mile distance, except on the eastern side, where the reef extends upwards of three miles beyond them. The passages between the keys must not be attempted, as most of them are barred by the reef, except on the west side of El Roque Key, where there is an entrance into a very fine bay, formed by the other keys and reefs, in which there are from 13 to 20 fathoms water; but a foul rocky bottom frequently does great damage to the cables. The anchorage is on the west side of the key, in 17 or 18 fathoms water, on sand and mud, and about three cables' length from the beach. The Roque Key may be easily distinguished by several peaks on it, that may be seen at a moderate distance. It will be most prudent to give all these keys a wide berth, as the vicinity of them will be perilous to a ship, particularly at night.

PORT EL ROQUE.—In October, 1827, while his Majesty's sloop Arachne, captain W. R. A. Pettman, lay at the above anchorage, a very fine harbor was discovered to the eastward of El Roque, and surveyed by lieutenant, now commander, E. O. Johnes: it is sheltered on the north by the French Keys, from the east by the N. E. Key and the reef, and on the south by Pirate and Naman's Key, and their reefs. From the Plan published at the Hydrographical Office, it will be seen that there is a space of about two miles in length, and half a mile wide at the narrowest part between the reefs, where ships may anchor in from 12 to 14 fathoms, and five entrances, or outlets, quite clean.

The Instruction says, "Port El Roque presents considerable advantages, as a safe and convenient anchorage, over that which seems to have been heretofore made use of by ships of war, and in which his Majesty's sloop Arachne came to anchor; as it will be evident by a reference to the Plan, that from whatever quarter of the compass the wind might blow, a vessel could scarce find a difficulty in getting to sea. Nor, from the manner in which it is locked in, by the keys and reefs, (a circumstance, of course, productive of a constant smoothness of water,) is it probable she could receive any injury, should her commander deem it necessary to ride out a gale at her anchors.

"Beside which, a ship will find another important advantage over the old anchorage—that of having, almost invariably, a clear unobstructed trade breeze across the reef, which can bring with it no decaying vegetable, or other impure effluvia, to render the place unwholesome: a circumstance not unlikely to occur, to the detriment of a ship's company's health, in the road where the Arachne lay, from its leeward proximity to a mangrove marsh.

"The channels are clean, and, without an exception, steep to the reefs on either side, which are of coral, and have scarcely sufficient water on their edges for a four-oared gig; thus displaying, by the contrast between the shades of deep and shallow soundings, a secure guide to a stranger on entering. The bottom is mostly of a hard sandy nature, though there was found a patch of stiff clay off the N. E. point of Pirate Key, in thirteen fathoms.

"The islands, with the exception of El Roque, appear to be of a coral formation, with a light sandy soil, thickly covered with the samphire plant; most having salt marshes, either in their interior or just within the reefs, which are skirted with mangrove and other timber trees, affording shelter to innumerable families of boobies, and other aquatic birds; as the marshes likewise abound in several delicious kinds of the snipe genus, that are by no means difficult to be got at.

"Fish of excellent quality may be caught in plenty, either with a seine, (the method we adopted,) or by anchoring in a boat near the reefs, and employing hook and line for that purpose. The only quadruped that came under observation, was a small description of rat, several of which were met with in visiting the peaks of El Roque. Those heights are of limestone, which is removed by slaves, and burnt in a kiln at their foot,

(the property of a Dutchman,) and then conveyed to the Island of Curazoa, to be made use of in the erection of forts, and for other government purposes. Turtle are met with, but not numerous.

"Ships requiring small plank, fine wood, boats' knees and breast hooks, can be well supplied for the labor of cutting them, though it is recommended, should time admit of it, to have it always barked, split, or sawed up, before embarkation, as, should the sap lodge upon decks or any thing else, the stains would be found difficult to eradicate. There is a well of water upon the S. W. end of El Roque. The supply is uncertain, never, however, exceeding 80 gallons a day. The lime burners obtain what they make use of by digging wells in the sand; and although that which was tasted was of an indifferent quality, it is not improbable that by a deeper excavation better may be procured.

"A stranger, in running for the harbor, is recommended to pass to the westward of the peaks, and then stretch across towards Blackman's Key, which may be easily known, as appearing, without the use of a glass, like a single large rock, (though actually a low islet with bushes on it,) until he can fetch through the south channel, which will open clearly to sea at the bearing of N. 16° E., per compass, when he can pass with safety between Pirate Key on the larboard, and a small dry sand bank on the starboard side, both of which are bold within the channel: but a reef extends 333 fathoms off the S. S. W. end of the former, which, like all others, is easily traced from a vessel's deck by the eye.

"On the full and change of the moon, it is high water at 4 h. 30 m. P. M. Spring tides rise 3 feet perpendicular."

ISLAS DE AVES.—Thirty miles to the westward of the Roques are the Islas de Aves, (Birds' Islands,) which are two groups of keys, rising upon two distinct reefs, and forming between them a channel of 9 miles in breadth. These keys are very low and flat; and as the east group has a reef extending 4 miles to the north from it, and the western another, extending 6 miles in the same direction, it results that an approach to them, especially from the north, is extremely dangerous; and therefore they ought to be given as wide a berth to as any other dangerous shoal.

BUEN AYRE LIGHT.—On Point Rasa del Lacre there is a light-house, containing a fixed light: the tower is 75 feet high.

BUEN AYRE ISLAND.—To the westward of Aves, and at the distance of 33 miles, is the Island of Buen Ayre. It is of moderate height, with several mountains and peaks on it, the most elevated of which is close to the north point. The south point of the island is rather low and flat, and called Point Rasa del Lacre. About the middle of the west shore, there is a town and a small fort. There also is the anchorage, which is so steep that at 1½ cable's length from the shore is a depth of 17 fathoms, and it increases so rapidly, that at a cable's length further out there are 60 fathoms. For this reason it is necessary to run out and make fast a cable to the shore. Small ships should always be prepared, in order to prevent the anchor from dragging; for should she be driven from the anchorage, it will cost much trouble to regain it. From the west part of the anchorage, at the distance of a mile, lies an island named Little Buen Ayre; and although the passage formed by it on the N. E. will admit ships of any size, yet it will be preferable to use the S. W. channel, as being more free, both inward and outward. There is no danger whatever to be apprehended at the distance of a cable's length from all the coast of Buen Ayre, except on the east side, where a reef runs out in some places more than half a mile; but the N. E. and S. E. points are very clean.

CURAZAO ISLAND.—Twenty-seven miles westward from the south point of Buen Ayre lies the S. E. point of the Island Curazao. It thence extends about N. W. ½ W., 35 miles, but the greatest breadth does not exceed 6 miles. It is moderately high, with some mountains, that may be seen from a considerable distance at sea. All its coasts are very clean, and may be passed at the distance of a cable's length, without risk. S. E. by E. from the S. E. point, named Canon, at the distance of 4 miles, there is a little low sandy island, named Little Curazao, which, although very clean, is, from its lowness, dangerous at night and in thick weather. Lieutenant D. F. Campbell says, "No part of this island appears elevated more than 6 or 8 feet above the level of the sea, except that on the west end there are two small clumps of mangrove bushes, showing higher than the rest of this land. The crew of a Dutch National Corvette had been employed (1826) in erecting on the east end a large cairn of stones, having on its top an old tree, and bearing at a distance a great resemblance to a martello tower. It bears from the mountain of Sta. Barbara, on the S. E. side of Curazao, E. by S. by compass. He passed within half a cable's length of the N. E., N., and N. W. sides of the island, and got no bottom with a line of 40 fathoms."

The Island of Curazao has many bays and harbors, the principal of which, where the whole commerce of the island is carried on, is St. Anne's, on the west coast, situated at the distance of 14½ miles from Point Canon. To the eastward of this, about 6 miles, is another bay, named Sta. Barbara. In proceeding to the Harbor of St. Anne, it will be proper to make Point Canon, so as to run down the coast at one or two miles' distance,

taking care not to get to leeward of the harbor's mouth, as the current sets with considerable strength to the westward. The entrance is very narrow, and formed by tongues of low land. That in the inner part also forms large lagoons. On the eastern point stand Fort Amsterdam and the principal town of the island, inhabited by Protestants and Jews. On an islet close to the west point there is a battery, which, with Fort Amsterdam, defends the mouth of the harbor; and on the western shore stands the town inhabited by the Catholics. The channel leading into the bay runs in about N. E. by N., is three-quarter's of a mile long, and a cable's length broad, except between the forts at the entrance, where it is barely half that breadth. The towns, wharfs, and magazines, are on the banks of this channel, where also ships anchor and are careened. To enter the chanel it is necessary to keep the windward coast close on board, but not within half a cable's length, as there are rocks, and also a reef, extending about one-third of a cable from it: and on getting abreast of the batteries on the point of Fort Amsterdam, luff enough to bring the ship's head towards the battery on the islet at the west point, and then stand inward through the middle of the channel. The Dutch always have a launch ready to assist in towing ships into the harbor.

ORUBA ISLAND.—At the distance of 43 miles to the westward of the most northerly part of Curazao, lies the S. E. point of the Island of Oruba, which extends thence nearly N. W. 17 miles, and is 4 miles wide. Although low, there are some heights upon it, that may be seen at a moderate distance off, particularly one, which, from its resemblance to, is called the Sugar-loaf. All the eastern coast is very clean, and has some islets close to it. On the western coast there is a chain of keys, extending almost so far as the west point. These may be coasted on the outside, at the distance of two cables' length, if necessary. This island lies to the northward of Cape St. Roman, the intermediate channel being 13 miles wide, and very clear.

Lieutenant D. F. Campbell, commanding his Majesty's schooner Monkey, visited Oruba in September, 1826. From his remarks we extract the following:—The island is moderately high; the east part even, and gradually lowering to a point. The west end, at a distance, appears like broken hummocks. The Sugar-loaf Hill, which is about 7 miles to the N. W. point, is the highest in the island, and may be seen at the distance of 18 or 20 miles. A chain of low bushy keys, stretches along the south shore, bold to, having, at a cable's length off, no sounding with the hand lead. These keys terminate in a rocky islet, considerably higher than the rest, about 3 miles to the westward of the east point, and 2 cables' length off shore. About 3 miles to the westward of the Sugar-loaf there is a projecting point, having an opening between the keys to leeward of it. To take the shelter afforded by this point, it is necessary to get close in with the land so far to windward as the Sugar-loaf, and run along shore till the port bears N. N. W., when the flag-staff will come on with a small red house standing by itself on a hill behind. These marks kept in a line will lead clear of a rocky ledge at the extremity of the point. To leeward it is all clear. When far enough in to be sheltered from the breeze, you may anchor in 4 to 5 fathoms, on sandy bottom. There are, however, some rocky patches to be carefully avoided. It is particularly necessary for a stranger to get close in with the keys well to windward, otherwise the current will sweep him so far past the opening as will require half a day to beat up again. There is also good anchorage in from 5 to 12 fathoms under the west end of the island; but as procuring provisions, or temporary refit, can be the only inducements for visiting Oruba, it is advisable to go into the harbor, which is distinguished by the town along the beach, close to leeward of the sandy point, and named Port Caballos. The pilots are skilful and attentive; and the anchorage, within the reefs and close to the town, in 3 fathoms water, sandy bottom, is very good. Fresh water is scarce, there being no spring. It is collected in tanks in the months of September and October, but is good and wholesome."

The following is from the remarks of Capt. T. W. Carter, of his Majesty's ship Emulous, October 1, 1815:

"The best anchorage about this island is on the south side, about 4 or 5 miles to the north-westward of the village. You may anchor on a white shoal in about 7 fathoms, with a low and very white sandy point bearing N. ½ E., a remarkable mountain, nearly resembling a sugar-loaf, at the back of the town, E. by S., and the easternmost extremity of the land S. E., at three-quarters of a mile off shore. You must look for a clean spot to drop your anchor, as some parts are rocky. Water may be procured here by digging a few feet in the sand, at a short distance from the beach."

The Gulf of Venezuela, or of Maracaybo.

From Cape St. Roman the coast runs S. 62° W., a distance of 13 miles, to Point Macolla. It is all shallow and clean,* and may be safely approached by the lead. This

* By the remarks of Capt. T. W. Carter, of his Majesty's ship Emulous, we find that on the 30th of September, 1815, when standing towards the shore, Cape St. Roman bearing E. N. E. ½ E., distant from 12 to 15 miles, and off shore about 3 miles, they fell in with a shoal on which the water

point, and Point Espada, (Sword Point,) which lies nearly west from it, at the distance of 50 miles, form the entrance of the Gulf of Venezuela, or of Maracaybo. The south extremity of this gulf opens into the Great Lagoon of Maracaybo, by a Delta that has but one mouth navigable, and that only for vessels drawing no more than 12 feet water, as there is a bar, upon which there is no more than 14 feet. Hitherto no chart of the coasts of this gulf has been drawn from actual survey, nor is the situation of the bar accurately laid down: yet, from practice, the course to it is tolerably well known, both from Point Macolla and Point Espada. The Hydrographic Commission, under the command of Captain Don Joaquim Francisco Fidalgo, surveyed and drew a chart of that part of the east coast from Point Macolla to Point Arenas, which is a little to the eastward of the bar. The inspection of this chart will prove a sufficient guide; and as the water is shallow, but without banks, or detached islands, the lead is the best guide that can be recommended. The same may be recommended for the west coast, which, though not surveyed, has been well explored; and it is ascertained that it may be safely approached to the depth of 6 or 5 fathoms, in every part. Those who enter this gulf have generally no other object in view than to proceed to the lagoon, for the purpose of loading with cocoa, tobacco, and other produce. We shall, therefore, now proceed to give some instructions for navigating it with certainty.

Being 4 leagues to the westward of Cape St. Roman, and thence steering S. W. by S., will take a ship in sight of the Mesas of Borojo, which are some level hillocks, or sand hills, situated to the east of the bar. From this situation steer about west, keeping at the distance of 2 leagues from the coast, and in from 4½ to 5½ fathoms water, until the Castles of Zapara and San Carlos appear in sight: these defend the entrance of the lagoon, and are placed, the first on the eastern point, and the second on the western. They are not, however, on the bar, but rather to the southward of it; the bar itself being formed by the *shoals*, which extend out W. N. W. to the distance of 2½ or 3 miles from the Bajo Seco, or Dry Shoal. The sea breaks on all these shoals, and the deeper water is easily distinguished by its having no breakers. This will be found by keeping at one and a half cable's length from the outermost breakers off Bajo Seco. This Bajo Seco is an islet of sand, which is about a cable and a half over in every direction: it lies N. N. E., at the distance of one and a half mile from San Carlos Castle, and at about east from it will be seen the other, named Zapara. The island of this name has some very high mangroves; and outside of it, in 5½ or 6½ fathoms, the bottom is hard mud, mixed with sand; and this is where ships ought to anchor, in case of necessity; observing that the ground tackle ought to be good, as the prevailing wind blows very fresh at the place.

Being off Point Espada, at the distance of 2 leagues, and bound to the bar, steering a S. S. W. ½ W. course will take a ship to the N. E. of the islet named Bajo Seco.

On this course, as well as the former, the depth diminishes very gradually as you advance southward; and it will be advisable not to approach the bar in the night, but to run out again, or make short boards about 4 leagues from it, until day-light comes on. The breezes in this gulf are fresh, and from N. N. E., which cause a heavy sea on the bar and all the south shore; so that there is great risk of getting aground, which must be guarded against.

High water on this bar takes place, on full and change of the moon, at a quarter after 5 o'clock, afternoon: on spring tides, the water rises from 2 to 2½ feet. The least water on the bar, at high water, in the season of the breezes, is 14 feet 8 inches; and 16½ feet in the rainy season, which is August, September, October and November.

The bar cannot be crossed without a pilot; and therefore as soon as the ship is nearly north and south with the Castle of San Carlos, and in 5½ fathoms water, the course should be altered to the west, until in the depth of 4½ fathoms, when the breakers on the shoals will be seen in a line, about W. N. W. Continue steering to the westward, keeping the same depth, until getting abreast of the last breakers, which will be near the mouth, heave to on the starboard tack; or, what is better, make short tacks off and on, until the pilot gets on board.

Steering for the bar, the first object that comes in sight, as being the highest thereabout, is the Island of Todas, or Todos, which lies about 3 miles to the southward of the Castle of San Carlos: shape a course towards this island, until the castles and the Bajo Seco can be seen, and then proceed as before directed.

A knowledge of the *exact situation* of the mouth of the bar is very essential: that is, to the westward of the meridian of the Castle of San Carlos; because, without this information, every person would suppose it to be between the Bajo Seco and the eastern coast,

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broke, having close to it 15 fathoms. He further adds, "The land being very low about this part of the coast, it would be dangerous to beat up along shore during night; although, with the westerly current running through the channel, a strong counter current will be found along the shore, and with the very strong breezes that you frequently get in this channel, it is difficult to get up, except by beating in shore. You will, however, find good anchorage all along this part of the coast, in from 5 to 10 fathoms; and during the day you may see all your danger."

where Zapara Castle stands. By such a mistake, the ship might be cast away on the shoals; or, if attempting to enter it, it would be a prodigy if every person on board did not perish: unfortunately, such accidents have sometimes occurred.

Vessels drawing from 9 to 12 feet water, should endeavor to be at the entrance at high water, to avoid all danger of even touching; for if she would not answer the helm immediately, the peril would be imminent. In such an event, from the narrowness of the channel, shipwreck would be inevitable.

A pilot is also requisite for getting over the Bar outward, and clearing the shoals: after which, particular instructions for sailing out of the Gulf are necessary: for although it must be done by working out, yet every navigator knows how to regulate his tacks, so that they may be more or less favorable; and here he may prolong either tack without any other guide than the lead. It is, however, necessary to remark, that in the Gulf the wind generally shifts to the north, or nearly so, at 4 or 5 o'clock, P. M.; therefore endeavors should be made to get near the Western Coast about that time, in order to take advantage of it for a long board to the E. N. E.; and to go on the other tack again, so soon as the wind rounds back again to the eastward; not only to gain northing by it, but also to get again over the West Coast, to make the best use of the next shift of wind to the north.

Directions for Navigating from Santa Martha to the Bar of Maracaybo, by Capt. Frederick Chamier, R. N., 1826.

"In sailing from Santa Martha for Maracaybo, I rounded Cape Aguja quite close, and by keeping within 5 miles of the foot of the Snow Mountains, carried the easterly set of the Magdalena up to Cape la Vela, and had likewise light winds from the westward.

"On nearing Rio de la Hacha, you must keep the lead going, as you will be in 5 and 7 fathoms water the whole night. After passing Cape la Vela, the best plan is to make one good stretch to sea, and the next morning you will in all probability weather Cape Chichibacoa: in which case you will weather Punta Espada, and be able to stand for the Bar of Maracaybo. You will run the greater distance from Punta Espada in 9 and 10 fathoms, and the shoaling of the water will be a guide to shorten sail for day-light.

"The best anchorage is with the Castle of the Bajo Seco in a line with that of St. Carlos, and distant from the latter about 7 miles, in about 6 fathoms water.

"The entrance of the Bar is in lat. 11° 2′: long., by chronometer, 71° 43′ W.

"The Bar of Maracaybo is a shifting bar; formerly the entrance was by the Island of Zapara, on the west end of which stands the Old Fort. It then formed its channel to the southward of Bajo Seco (which at that time was not above water, although now an island of some magnitude, and the principal defence of the entrance,) but now it seems to have settled into a permanent channel of 13 feet depth, to the N. W. of the Bajo Seco. The whole Bar is a quicksand, and when the Britomart grounded in passing, although the stream anchor was towed in the cutter a cable's length astern, and dropped instantly, yet we hove it up without starting the vessel in the slightest degree. Having ultimately been obliged to heave the guns overboard, the sand covered them so deeply, that the buoy rope, which was the same as is allowed for an anchor of 16 cwt., snapped before we could raise the gun sufficiently to sweep it, and that only the next day.

"To pass the Bar, a pilot should always be taken: the difficulty is to get one; an old Spanish ordinance being still in force, that no foreign man-of-war is to be taken across.

"The town of Maracaybo stands 21 miles up the lake, and you have to pass over the Tablazos, shoals of soft mud, with about 10 feet, in some places, which you may drag through with ease.

"I came out over the Bar against a head sea, drawing eleven feet fore and aft, and never touched.

"Water can be procured, if you are outside of the Bar, from the main land, exactly opposite the fort of the Bajo Seco: and, if inside, the lake is fresh water 10 miles above the Bar. The seine may be drawn any where in the sandy bays; but the alligators are very plentiful.

"Although the Derrotero de las Antillas and others mention the depth of water on the Bar in the rainy season, from August to November, to be 16½ feet, yet no more than 14 feet, and that only in one place, could I succeed in finding. The tides are very strong indeed."

Continuation of the Coast from Point Espada to Carthagena.

It has been already said that Point Espada is the west point of the entrance to the Gulf of Venezuela, or of Maracaybo; from it the coast trends about N. W. by N. a distance of 13 miles, to Cape Chichibacoa, and is all so clean and shallow, that the lead is a sufficient guide: and, although the coast is low, there are several peaks which rise inland, the highest of which are named Sierras de Aceyte.

From Cape Chichibacoa, N. 75° E., at the distance of 10 miles, are the Monges del Sur, or Southern Monks, which are two very small and perfectly clean islets, so that

they may be passed at the distance of half a cable's length, without any fear. About N. E. by E. from them, at the distance of 3 miles, there is another, named Monge del Este, or East Monk, which is also very clean; and at the distance of 8 miles N. ½ W. from the first is another group of seven islets, named Monges del Norte, or Northern Monks; these are *foul* with a *reef*, and ought not to be approached at less than a mile. The channels which the Northern Monks form with the east and with the Southern Monks, as well as between them and the coast, are very free and clean; therefore there is not the least risk in navigating them.

From Cape Chichibacoa the coast bends nearly W. N. W., 25 miles, to Point Gallinas,* which is the most northerly part of all this coast. From Point Gallinas the coast bends to W. S. W. a distance of 5 miles to Point Aguja, from which a shoal bank extends a mile out to sea. At Point Aguja the coast turns to the southward, and forms a bay of small extent, named Bahia Honda Chicha, or Little Bay Honda, which has very shallow water, and affords no shelter: next to this is the Harbor of Bahia Honda, the eastern point of which is 4 miles from Point Aguja.

BAHIA HONDA is a bay of great extent, and its mouth is 3 miles wide. In entering this bay you have only to be careful to avoid a shoal which lies in the mouth of it, and in a line with the two points of the entrance, and which is distant from the west point three-quarters of a mile, and from the east point a mile and two-thirds. This bank, whose greatest extension is nearly E. and W., is about one-third of a mile in length, or a little more; and the least depth of water on it is at the east end, where there is only one foot; upon which, with the slightest wind, the sea breaks. In other respects the bay is shallow and clean, so that no other guide than the lead is required for choosing an anchoring place in it, the depths being from 4 to 8 fathoms. The coast from Cape Chichibacoa to this bay, is low and level, but clean and shallow, so that no other guide than the lead will be required.

From the west point of Bahia Honda the coast runs about S. W. for the distance of 11 miles, to a large Bay, named El Portete, the entrance of which is very narrow, and the depth of water in the interior will admit none but small vessels. From El Portete the coast trends about west, for a distance of 14 miles, to Cape la Vela; the coast is clean, and from Bahia Honda the land begins to rise higher. One league before arriving at Cape la Vela there is a little hill, in form of a sugar-loaf, against which the sea breaks, and which projects about half a mile to the northward of the rest of the shore. From this hill the land continues of a good height, rounding southward so far as the west point, which is that properly named Cape la Vela: about 2½ cables' length to the westward of this point, there is an islet, or rock, very clean and steep to, which may be passed at a ship's length, if you please. The channel between it and the cape is quite clear, and may be run through without risk of danger, there being 5½ fathoms in the middle of it; but it is better to keep near the islet than the cape, because there are 5½ fathoms water close to the former, and only 4, or even less than 3, near the latter. The land about Cape la Vela is very sterile, and S. E. from it, about 7 miles inland, there rises a mountain, named Sierra del Carpentero, the Carpenter's Mountain.

ANCHORAGE OF CAPE LA VELA.—From the cape the shore trends to the southward, forming a large bay, where there is shelter from the trade wind: to enter it no other guide than the lead is necessary, for all the bottom is clean and so shallow, that at 2 miles from the coast there are 5½ fathoms, and from that the depth gradually diminishes towards the shore.

CAPE LA VELA TO POINT MANARE.—From Cape la Vela the coast runs about south, with some inclination westward, 23 miles, to Castilletis Point, where there is a grove, or group of mangroves, from which the cape bears N. 21° E. From this point it trends S. 74° W. 14 miles, to Manare Point, and between the two bends a little to the southward, with some projecting points. S. 72° W., at the distance of 13½ miles from Manare Point, is that of La Cruz, the intermediate coast being nearly straight, although the Points of Almidones, Pajaro, and the Fonton de Jorote, project out a little. Between the two latter, at a mile and a half to seaward, lies the Pajaro, or Bird's Shoal, with 2 fathoms water on it, on sandy bottom.

From Point de la Cruz, at the distance of 4 miles S. 54° W., is Point Vela: and at 7 miles from it, S. 42° W., are the city and river of La Hache. The coast thence trends S. 64° W. and S. 53° W., to Punta Dibulle, which is 31½ miles distant from the city of La Hacha. From Dibulle Point the coast runs west, and N. 75° W., to Cape San Juan

* A shoal of 4½ fathoms, or less. On the 7th of July, 1827, his Majesty's ship Druid, Capt. Samuel Chambers, running along shore to the westward, suddenly shoaled the water from 10 fathoms to 4½. Capt. Chambers says, "I understand there are only 2 fathoms on it, and it is not in any chart that I have seen. Its latitude is 12° 30′ N., longitude 71° 46′ 30″ W. Point Gallinas bears from it S. S. E., distant 5 miles, and Bahia Honda S. S. W. ¼ W. Ships of a large draught of water should not go nearer than to bring the low sandy hills on the shore in sight. If clear weather, the high land of Chiniare will be seen.

de Guia, which is distant 38½ miles from Dibulle Point. All this coast, from Cape la Vela to 12 miles east of San Juan de Guia, sends out a bank of soundings, more or less projecting into the sea, as may be seen in the charts published at the Hydrographical Office; but it is dangerous on account of several shoals on it, which extend a considerable way off to sea. The first shoal, which is already noticed, is that named Pajaro; and the second, named Navio Quebrado, or Wrecked Ship, is situated at 2½ miles from the coast, between the Laguana Grande and the Laguana Navio Quebrado, in latitude 11° 26′ 15″, and longitude 73° 14′ 30″ W.; therefore ships should not approach the coast nearer than 4 leagues; and care should be taken not to get into a less depth than 20 fathoms. The shore is generally low; but somewhat to the westward of the city of La Hacha, the celebrated Sierra Nevadas, or Snowy Mountains, begin to rise inland, well known, not only for the great elevation, but also because the summit terminates in two peaks like sugar-loaves, which are always covered with snow. These mountains extend to the westward, and terminate under the meridian of Cape Aguja.

Instructions for taking the anchorage off the CITY OF LA HACHA.—Although we have said it is not advisable to approach this coast, but to steer a direct course from Cape la Vela to Cape Aguja, and take care to get into no less depth than 20 fathoms; nevertheless, as vessels bound to La Hacha must of necessity stand in for the shore, it is requisite to give some rule by which they may do it without risk. To take the anchorage off the city of La Hacha, and being near the rock or farallon at Cape la Vela, it will be necessary to steer S. 53° W. or 55° W., with which course run in sight of the coast; and having run 51 miles they will be on the meridian of the city of La Hacha, in 5½ to 6½ fathoms water, on sandy bottom, and may then direct themselves to the anchorage without more attention than by the chart appears necessary, observing that large vessels ought to steer for the anchorage N. N. W. of the city, in 5 or 6 fathoms; and when they sail from it, they ought to follow this course until they are three leagues out.

The taking of this anchorage, as well as all others which have no secure distinguishing marks, demands some vigilance: and as a case may happen in which a vessel may pass it, the bank of 4½ and 5 fathoms, on gravel, sand, and rock, which lies 15½ miles to the westward of the city of La Hacha, may serve as a mark for ascertaining her situation. The snowy mountains of Santa Martha may also serve as good marks for the same purpose.

From Cape San Juan de Guia the coast runs W. N. W., W., and W. S. W., a distance of 12½ miles, to the north part of the islet of Cape Aguja, which forms a prominent or projecting front of high hills scarped, and with deep water close to, with several coves or small bays, and good anchorages. The islet of Cape Aguja forms, with the cape, a channel of three-tenths of a mile in breadth: but the passage is very narrow, on account of the reefs which extend out both from the cape and the south part of the islet; so that, although there is water enough for any vessel, yet none should attempt it, as by so doing they would run the risk of being wrecked.

To the N. W. of the islet of Cape Aguja there are three rocks, or farallones, very near each other; and the one which extends farthest out, which is also the largest, is at the distance of three cables' length. There is another, to the westward of the west point, which is higher than either of the former, and is also at a short distance; they are all clean, and steep to. From Cape Aguja the coast trends S. 31° W., 3½ miles, to Betin Point, which is the north point of the Bay of Santa Martha, and the south point of the Bight or Ancon of Tagango; the coast is high and scarped, with some beaches and indents.

SANTA MARTHA.—The harbor of Santa Martha may be considered as one of the best on this coast. To the westward of its northern point, called Point Betin, at the distance of half a cable, there is a farallon, or rock, named El Morrochica, which is very clean, so that it may be passed at half a ship's length, if necessary: between it and the point there are from 5 to 8 fathoms water; but we advise that no one should attempt this passage, which is so very narrow, as there is nothing to be gained by it. About 4 cables' length to the westward of the same point lies an islet, called the Morro, also very clean, so that it may be passed on either side at the distance of half a cable's length. There is a fortification on this island, which, with other batteries on the coast, defends the harbor and city. The channel between the Morro and the rock off the point is very open and clean, with a depth of water from 13 to 27 fathoms. The bay is also very clean, and the bottom good; there is nothing in it to avoid, or give a berth to, but a bank before the city, which extends out about half a mile from the beach; but as the depth diminishes gradually from the edge, the use of the lead will be sufficient to avoid all risk from it. The best anchorage is to the northward of the city, as much as possible within the cove, or basin; to enter it, pass at about half a cable's length outside of the Morrochica, steering thence so as to pass at about the same distance from some rocks which

extend southward from the point;* having passed them luff as much as possible and anchor where most convenient, with the precaution of being guarded against the edges which extend from the coast and the points, exhibited in the particular plan of the harbor. On entering into this anchorage, be particularly attentive to the sails, &c., for the gusts of wind come off the land very heavy. The River Manzanares disembogues a little to the south of the city, which, although not large, has very good water.

FROM SANTA MARTHA TO THE RIVER MAGDALENA.—From Gaira Point, which is the south point of Santa Martha, the coast trends nearly south 13½ miles, to the Cienega, which is a lagoon, formed by some of the branches of the river Magdalena. From this Cienega it bends to the west, and W. N. W., a distance of 34 miles, to the western mouth of this celebrated river, named Boca de Ceniza, leaving at 8 miles to the eastward another, named Boca de Rio Viejo, or Old River. These streams form an island in form of a Delta, named Isla de los Gomez, which is six miles from north to south, and eight from east to west. By the two directions which the coast takes from Santa Martha, it forms a very large bay, in the bottom of which is the Cienega. All this coast is low and shallow; and from the Cienega towards the west, it forms the Isla de Salamanca, the west point of which is formed by the Boca de Rio Viejo. The waters of the Cienega, and those which form this island, communicate with the Magdalena by several small channels. The current of this great river is so powerful, that at more than five leagues out at sea it gives a *greenish color* to the water, resembling that over a shallow bank. All the bay may be coasted by a hand lead, for it is all clean. The west part of Isla de los Gomez, and the east part of Isla Verde, or Green Island, form the Boca de Ceniza of the River Magdalena; and in the middle of this mouth there are two keys.

The Isla Verde stretches from east to west a distance of 5 miles, and to the southward of it is another, of greater extent, called Sabanilla, at the S. W. end of which is a harbor of the same name, with 4½, 5½, and 6 fathoms water, on sand and mud.

The Derrotero being silent on this harbor, we introduce the following account of it from documents in the Hydrographical Office:

"The Harbor of Sabanilla is situated about 7 or 8 miles to the south-westward of the Boca de Ceniza of the Magdalena River, and is formed by the main land on the south side, and by the islands Sabanilla, Verde, and others, on the north side. Its entrance is between the point of Morro Hermoso and a shoal bank that extends about 4 miles south-westward from the Isla Verde, and nearly 2 miles from the west end of Sabanilla Island. The extremity of this bank has about 7 feet water on it, and lies about 3 miles north-eastward from Morro Hermoso Point."

Directions for Sabanilla Harbor, by Jodrell Leigh, Esq., Commander of his Majesty's sloop Ontario, 1820 *and* 1821.

"On making Sabanilla, it may be known by a remarkable table land lying about two miles to the westward of the fort. On the east end of the table land is a square hummock, resembling a battery. Bring this hummock to bear S. E. ½ S., and a red cliff will be seen, which steer directly for, and you will pass to the westward of a shoal, with only 7 feet water on some parts of it, that extends 4 miles from Isla Verde. Its bearings are, the Red Cliff S. E. by S.; Morro Hermoso Point S. W. by S.; the west extremity of the land S. W.; and the N. W. point of the island N. by E. ½ E. These bearings were taken in a boat, in 7 feet water, on the edge of the bank; and at the distance of 30 yards from it, there are 5 fathoms, increasing regularly.

"When the west extremity of the land is shut in with Morro Hermoso Point, you will have passed the point of the shoal, and may haul up towards the fort, in from 5½ to 3 fathoms. The bearings at the Ontario's anchorage were, the fort N. E. ½ E.; west point of the island N. by W. ¾ W.; and Morro Hermoso Point S. W. ¼ W., at a quarter of a mile from shore.

"When turning into this harbor, care must be taken to avoid a shoal on which the Ontario tailed when in stays. It lies about a quarter of a mile from the Red Cliff, with the following bearings:—The outer part of the island N. N. W., and the fort E. N. E. On the inside of this bank is a reef of rocks, some of which are above water. On the

* Probably there are sunken rocks lying at a greater distance from Point Betin; for Captain S. Chambers, of his Majesty's ship Druid, says, that "having been driven out from the anchorage by heavy squalls twice; on the morning of the 27th of February 1828, in again taking the harbor, the ship grounded on a rock not laid down in the chart, and which he had passed inside of on the previous morning. It bore from the east end of El Morrochica S. 55° E., from the S. E. of Point Betin, S. 46° W., and from the West Point, S. 10° W., all true bearings. On its inside it is quite perpendicular, with 5 fathoms, decreasing gradually to the shore; its outside is a quick descent to 9, 12, and 15 fathoms; and on the top of it are exactly 12 feet."

outside the depths are from 6 to 3½ fathoms, and on it there are from 3½ to 2 fathoms. It is composed of sand and mud, and is, perhaps, formed by the freshes of the small rivers throwing the mud into the current, which, setting to the westward, carries it against the rocks, and there being stopped, forms a spit, or bank.

"There is also another shoal, or oyster bed, on which the schooners Kate and Experiment lost their rudders. Its marks are the magazine in the fort, open a little to the eastward of the guard-house, also in the fort, and a remarkable notch in the bottom of the bay on with a bluff point to the northward of the custom-house. Ships of war have no occasion for going so far up, as the anchorage is equally good a mile below it.

"As the wind generally blows from the N. E., ships are obliged to work up to the anchorage. They ought not to stand in-shore to less than 5 fathoms, nor to the northward into less than 5½, as the bank is steep to, and on the shore side, abreast of the Red Cliff, is the reef above mentioned.

"I have been informed that heavy gales, or great freshes from the Magdalena, cause the banks to shift. During several visits to this harbor, we found the current setting to the westward, owing, perhaps, to the easterly current, which, from Galera de Zamba, meets the freshes from the Magdalena, causing an eddy over the outer bank into Sabanilla Bay, which, not being able to escape to the eastward, returns along the south shore of the bay, and round the S. W. point, to sea.

"There is no regular tide at this part of the coast, but the water sometimes falls and rises 4 or 5 feet.

"Water of an indifferent quality may be procured here from the S. W. mouth of the Magdalena; but the bar is so shallow that nothing but small boats can get in. Fire-wood may be easily obtained in any quantity, the beach near the river being nearly covered with drift wood."

Directions for entering Sabanilla Harbor, by Capt. W. B. Bigland, R. N., 1821.

"The land to the eastward of the anchorage is quite low, and full of trees. It consists of small islands lying about the mouth of the River Magdalena. The shore on the north side of them, I believe, is safe, by attending to the lead; but I would not advise any person to approach it nearer than 2½ miles.

"Coming from the eastward, and having a distinct view of the S. W. part of the low islands, and the high land to the southward of them, go no nearer than 2½ miles, but continue steering westward, until the point of Morro Hermoso bears about S. by W., and then steer directly towards it, until you bring a small hummock upon the table land to the southward to bear about S. E., (some yellow-faced cliffs, close to the water, will then be seen, and nearly on with the said hummock.) You may then with safety haul up for it, and it will lead you clear to the S. W. of the shoal that stretches off 2½ miles S. S. W. from the low islands, with only 5 feet water on it. Keep this latter mark on, and run S. E., until you get a small whitish looking house to the right of the fort, and close to the water, a little to the eastward of the highest part of the highest of three hills at the back of the fort, bearing E. ¼ N.; then haul up for it, which is about as high as a ship will lie, as the wind is generally at N. N. E.

"But if, in going in, you should happen to get into 7 fathoms water, before you have the latter mark on, bear up to S. W. immediately, until you deepen to 9 or 10 fathoms, which you will soon do. The reason for this precaution is, that if you are without the bank, you may have 6 fathoms, and before another cast of the lead can be had, the ship be on shore.

"On a line with the S. W. part of the shoal and the main land, there are not more than 6½ fathoms water. Ships of a small draft may anchor close to the fort, in 3 fathoms.

"There are good turning marks for working up to the fort, but rather difficult for strangers to understand. In standing south-eastward, be careful to keep a good lookout for a small red or yellow spot in the land to the N. E. of the custom-house, and keep it open of the fort. In standing northward keep a very small hillock on the land, a considerable distance off, just open of the south-easternmost low land, though this will not be known unless pointed out. A frigate may work in by standing no farther to the S. E. than the depth of 5 fathoms, nor to the northward than 5½ fathoms. In mid-channel, above the line of the S. S. W. part of the reef, there are no more than 6¼ fathoms, on muddy bottom. The soundings are very regular, but in standing towards the reef it is steep to.

"The fort is not very conspicuous, but may be seen 8 or 9 miles. It has 6 guns, which cannot be seen one mile off, and a small howitzer. It is situated on a rising bluff under the high land.

"His Majesty's ship Euryalus anchored on May 4th in 5¼ fathoms, on soft mud, with the northernmost island bearing N. 43° E.; Point Morro Hermoso S. 50° W.; highest red bluff S. 55° E., distant nearly a mile: the fort N. 46° E.; and the custom-house N. 41° E. On the 16th of the same month, she anchored in 7 fathoms, on soft mud, with the northernmost small island N. 2° E.; the custom-house N. 40° E.; the lower

house at the fort N. 58° E.; the double highest red bluff S. 60° E.; and Point Morro Hermoso S. 40° W.

"A frigate might work up a half or three-quarters of a mile nearer the fort, and anchor in 5 fathoms, to windward of all the red-faced land. About 3 cables' length off lies a rock just above water, with two others close to its north side, with 2 feet on them; and another 20 yards N. E., with 4 feet on it. There are 4 fathoms close to their N. W. side, and 2½ fathoms between them and the shore. The custom-house kept open of the fort clears them. Although these rocks are out of the track of vessels working up, it has been thought proper to notice them, as they are dangerous for boats."

COAST BETWEEN ISLA VERDE AND GALERA POINT OF ZAMBA.—From the Isla Verde the coast trends S. 58° W., for a distance of 33 miles, to Galera Point of the Island of Zamba, or Zamba Point: the shore between forms a bay of five or six miles in depth, all of it being shallow: for, at 3 leagues from the shore, there are only 26 fathoms of water, on muddy bottom. The Cascabel and Palmarito Shoals are in it; the first, very near the coast, in the middle of a little bay formed by the Morros, or hills of Damas and of Inasco: the second is more dangerous, for it lies at a league off shore, N. 26° W. from Morro Pelado, or Bald Hill,*

ANCHORAGE OF GALERA DE ZAMBA.—The Galera Point of Zamba is so low that, when there is a fresh breeze, the sea washes over the greater part of it. To the west, W. N. W., and N. W. of its western extremity, and at the distance of 2 miles from its most projecting part, there are four small banks, of different sizes, with 5½ fathoms water, on black sand. Between these banks, and between them and the coast, the depths are 7, 8, 9, and 10 fathoms, black sand. This Galera Point of Zamba projects into the sea about 8 miles, and forms on its south part an anchorage, sheltered from the breezes; but, in taking it, great care is necessary, on account of the banks in it, and of the Isla de Arenas, or Sandy Island, which lies in the middle of the Bay of Galera de Zamba; therefore, every one intending to enter into this anchorage, must pay great attention to the hand lead.

At S. 26° W., distant 14½ miles from Point Galera of Zamba, is the Point of Canoas, which is low at the water's edge, but hilly very close to it. Between these two points the coast is of moderate height; and at about one-third from Point Canoas there rises a hill, forming table land at its top, with several barrancas, or reddish colored ravines, upon it, called Bujio del Gato. On the intermediate coast there are several dangerous spots. Of these, the first is the islet Cascajal, which lies from the Point Galera of Zamba S. 6° E., at the distance of 6 miles, and from the coast a long mile and a half. North, and N. 6° E. from this islet, at the distance of one mile and three-tenths, and eight-tenths of a mile, are two little banks, with 2 and 4 fathoms water on them; and there is another, of equal depth, lying N. 58° W., at the distance of two short miles from the Cascajal. S. 14° W. from the Point Galera of Zamba, and at the distance of seven short miles, is the west rock of Bujio del Gato Shoal, which extends a long half mile from north to south. At about N. N. E. from its north extremity, distant half a mile, there is another rock, called the N. E. rock, or Una de Gato, Cat's Claw. The depth on the outside of this shoal is 7, 8, 9, and up to 14 fathoms, at the distance of 2½ miles. There is also, at the distance of 3½ miles N. 31° E. from Point Canoas, a rocky bank, of 3 fathoms water. This lies in the middle of the Bay of Bujio del Gato. We ought to warn the navigator that going into this bay is dangerous, especially by night, and if he is compelled to do so, he ought not to go into a less depth than 20 fathoms.

NEGRILLO SHOAL.—The Point of Canoas has lying off it, at the distance of one long mile and a quarter, S. 49° W.,† a shoal, called the Negrillo, of one quarter of a mile

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* Captain J. F. Chapman, when commanding the Nautilus sloop, on the 8th of July, 1821, while working to windward on this coast, and being about 3½ miles from the nearest shore, with Morro Hermoso bearing about E. N. E., distant 5 or 6 miles, struck on an *unknown rock*, not three times the size of the ship; it had 11 feet water on it, and 6 fathoms all round it. In a subsequent account he describes it bearing S. W. from Morro Hermoso, at the same distance from it, and from the nearest shore.

The difference in the given bearings of Morro Hermoso precludes the possibility of assigning to this rock a place in the chart; but it has been thought advisable to insert the above account, in order to excite the vigilance of those who may hereafter have to navigate on this part of the coast.

† SUNKEN ROCKS OFF CANOAS POINT.—On May 27th, 1829, H. B. M. Spey, W. James, commander, struck on a reef of rocks, Canoas Point bearing N. E. ½ N., distant about three miles. On examining this reef, it was found to consist of several heads of rocks, about 100 yards in length, with three to 5 fathoms between them, 7 fathoms all round them, and on the tops, which are sharp pointed, from 4 to 5 feet. The current was setting to the N. E., one mile per hour.

On May 5th, 1826, H. M. S. Isis, Capt. H. Patton, struck on a rock, with Canoas Point bearing N. E., the estimated distance from the land about 2½ or 3 miles. When she struck, there were 7½ fathoms under the main chains.

These rocks are evidently the continuation of the Negrillo Shoal, which, therefore, has not been correctly placed in the Spanish surveys. Measures have been taken to ascertain its extent and position.

extent. It is composed of three rocks, at a short distance from each other, in a triangular form, with from 2 to 5 feet on them. All around these rocks, and very near to them, there are 6, 8, and 9 fathoms water, on a bottom of rocks, small gravel, and sand; and the channel between them and the coast would be practicable, were it not for three sunken rocks, which make it difficult to pass. From the Negrillo Shoal, the hill of La Popa, at Carthagena, bears S. 4½ W., distant 7⅔ miles; and this bearing may, if necessary, serve to guide the navigator clear of it. At S. 50° W., a short mile from the southernmost Morrito, is the Cabeza Shoal, with 2 feet of water on its shoalest part.

CARTHAGENA.—From Canoas Point the coast trends to the eastward a long mile; and thence it bends round to the southward 3 miles, where rise some little hills, called Los Morritos. From these, the coast, which is low, and covered with mangroves, trends S. 33° W., 5½ miles, to the city of Carthagena, which is built upon the western part of this swampy land. About one mile and three quarters to the east of the city, rises the hill of La Popa, on the summit of which there is a convent of Augustine Monks, and a chapel or sanctuary, dedicated to the Virgin of La Popa. In clear weather, this hill may be seen, from the quarter-deck of a line-of-battle ship, at the distance of 10 leagues.

HARBOR OF CARTHAGENA.—The little tongue of land on which the city is built, extends S. S. W., two short miles from it; then turning round to the east, it forms, with the main land, a basin, which is the anchorage or harbor, and which is as well sheltered as the best arsenal. One mile to the southward of the exterior point of the little tongue, of which we have just spoken, is the north point of the island called Tierra Bomba, and the passage which is formed between the two is called Boca Grande, and which is artificially closed in such a manner, that only boats, and vessels drawing very little water, can enter by it. Tierra Bomba Island is about 4 miles from north to south, and its south point is the north point of Boca Chica, which is the only entrance to the harbor of Carthagena. The south point of this entrance is the north point of another large island, named Baru, and which is separated from the maint and by a creek named Pasa-Caballos, navigable by canoes only. On both points of the Boca Chica, there are castles to defend the entrance. That on the north side is named San Fernando, and that on the south, San Josef. This boca, or entrance, is rather more than two cables' length in width; but there are parts of it where the bank of shallow water which extends off from the southern castle (San Josef's) narrows it one half.

This entrance opens first into a large and well sheltered bay, where there is a depth of 13 and 15 fathoms. To the north of this the eastern coast of Tierra Bomba inclines towards the main land, leaving a channel of a mile in width, at the entrance of which, and in its middle, are some shoals, which lie to the westward of an islet called Brujas, and which is very near to the main land. Through this strait is the entrance into a second bay, which corresponds with, or is opposite to, the Boca Grande, and in which there are also 14 and 15 fathoms. To the north of this second bay there is an entrance of less than half a mile wide, defended by other castles, and which conducts into the harbor. This channel or entrance has a shoal in the middle, which forms it into two very narrow channels, but with 8 to 12 fathoms water; and the depth in the anchorage no where exceeds 11 fathoms.

Having given an idea of the harbor, we shall now speak of the exterior coast and the shoals.

BANK OF BOCA GRANDE.—From Point Canoas to Boca Grande there is a large bank, on which the depth of water diminishes gradully; and there are 9 fathoms at 4 miles, or somewhat less from the land. This bank is named the Playa Grande, and ships may anchor on it, in 7 or 8 fathoms water, on a bottom of grey sand, in front of the city. After passing the most northerly part of Tierra Bomba, the depth increases to 20, 30, and 40 fathoms; and at 2 cables' length from the shore there are 6. To the westward of Tierra Bomba, at the distance of 4 miles, there is a shoal, called the Salmedina, which has been much spoken of, on account of the great loss of ships which it has caused. This shoal, which is little more than a mile in extent from north to south, and a little less from east to west, lies with the following bearings:*

The Head, or North Edge of it.

The Castle del Angel	S. 64° E.
Hill of La Popa	N. 68 E.
N. W. Point of Tierra Bomba	N. 80 E.
Point Canoas	N. 35 E.

The South Head, or Edge, on which the sea generally breaks.

The Tower of the Cathedral	N. 55° E.
Hill of La Popa	N. 62 E.
N. W. Point of Tierra Bomba	N. 70 E.
Point Canoas	N. 33½ E.

* These bearings do not agree with the position of the shoal in any of the charts.

In addition to these marks, by which it may with certainty be avoided, in running from Playa Grande for Boca Chica, ships ought to get into from 6 to 8 fathoms, to the west of the city, and at the distance of three short miles from it, and then steer south, without inclining anything to the westward; and so soon as the depth increases, keep more to the larboard hand, in order to close in with Tierra Bomba to the distance of half a mile; and run along thus, closing to within a pistol shot of the north shore, at the entrance of Boca Chica, avoiding the south shore, which is foul. To enter Boca Chica, and navigate within the bays, up to the harbor, requires a pilot, and one may always be obtained at Boca Chica.*

As the harbor of Carthagena may be made by ships from the southward, it is necessary to give some description of the south coast, as far as the islands of Rosario, in order to connect all the information required for making the land with correctness and safety.

We have already said that the south coast of Boca Chica is the north coast of the Island Baru. The exterior coast of this island, from the point forming the entrance of Boca Chica, trends S. 35½° W., for 13 miles, to Baru Point. This coast is sufficiently clean as far as an islet, named the Farallon of Perico, from which to the south it is very foul, with a reef. To the westward of this latter part of the coast, that is, from the Farallon of Perico southward, are the Islands of Rosario, of which there are four principal ones, with several small islets. The easternmost and southernmost of these, which is also the smallest, is named Isla de Arenas, and it is distant from the shore of Baru scarcely one mile and a half: but the channel between them is reduced to three-quarters of a mile, by the reefs and shoals which extend from both sides. W. N. W. ½ W., at the distance of 3½ long miles from Arenas Island, is the Island of Rosario; and to the northward of these two, is that named Isla Larga, or Long Island, which is the largest, and which, with its banks, shoals and islets, extends out to the westward farther than Rosario Island. To the northward of the middle of Isla Larga, at a little more than 3 miles distant, lies the Islet Tesoro, with a reef to the westward. The channel between them has from 17 to 25 fathoms water, on a bottom of sand and rocks, from which Boca Chica bears N. 63° E.,† distant 10½ miles.

The Rosario Islands are very foul, and no one should sail among them unless well acquainted; but always keep at a sufficient distance to the westward, in order to avoid the shallows, which extend out from them. About S. S. W., distant 7 miles from Rosario Island, there is a shoal called the Tortuga. These islands are fertile in trees, and to the southward of them there is good shelter from the trade wind. Besides the Bank of Rosario Island, there are two others, one 3½ miles to the W. N. W., and the other 2½ miles S. W. by S. Both are rocks and sand, with 6 and 7 fathoms water on them.

Observations and Reflections on Navigating on the Coast of Colombia, from the Dragon's Mouth to Carthagena.

Reflecting on what has been stated respecting the winds that are experienced on this coast, it would appear that nothing further need be added to the description already given, to enable the navigator to prosecute his voyage with the greatest safety. In fact, as there is on this coast only the general breeze, or trade wind, neither hurricanes nor hard norths are to be feared, the first being absolutely unknown, and the second, if they do at any time occur, never exceed the strength of the ordinary breeze. If in the rainy season, that is, from May to November, there are sometimes strong southerly winds, they must be considered rather as squalls with heavy rain, of short duration; and as they blow off shore, do but little injury. This coast, therefore, especially as far as Cape La Vela, may be considered as a continued harbor, as far as climate is concerned; and no more is necessary to enable us to avoid every danger upon it, than a reference to the description given; for we are sure that the loss of a vessel upon it has been very rarely the effect of a storm.

From Cape La Vela westward, it is proper to give some notices; for as the breezes, especially from Cape Aguja, or rather from Point San Juan de Guia, are exceedingly strong, so much so, that they may be considered as real gales, it becomes necessary to present some rules for making the different harbors, to prevent as much as possible those inadvertencies that, during such unmanageable winds, might prove of the most serious consequences. The shifting of the wind, which we have before said sometimes changes

* According to the remarks made by Mr. J. Whidbey, when master of his Majesty's ship Europa, it appears that ships having occasion to anchor and stop in Boca Chica, should haul round the S. W. point of Tierra Bomba, at the distance of half a cable's length, and run along by the beach, until the centre of San Fernando Castle bears N. E., true, and then drop an anchor in 13 fathoms, at about 100 yards from the beach. They may then moor with two-thirds of a cable on the N. E. anchor, and half a cable on the S. W., in 16 fathoms, which ought to be the bearings of the anchors. When moored, the centre of San Fernando Castle will bear N. E., as before, the centre of San Josef Castle, E. S. E., and the extremity of Tierra Bomba, W. N. W.

† By the Chart it bears N. 57° E.

to S. and S. W.; from June to November, raises some doubt with respect to the navigation, and therefore the following reflections will not be considered irrelevant; for though they may not be necessary for those who are acquainted, they cannot fail of being beneficial to those who are not so.

The principal commercial establishments on this coast, and towards which vessels from Europe in general direct their course, are Cumana, Barcelona, Laguayra, Porto Cabello, Maracaybo, Santa Martha, and Carthagena; Pampatar, in the Island of Margarita, and Santa Ana, in the Island of Curazao. It being a general rule on this coast, as well as in the whole Sea of the Antillas, or Caribbean Sea, to make the land to windward of the port of destination, as a matter of necessity, to prevent the trouble consequent upon getting to leeward of it, we may say with safety, that, being once within the Sea of the Antillas, all those who intend to anchor at either Margarita or Cumana, should close with the coast about Cape Mala Pasqua, or Cape Three Points, passing in preference through the channel which Margarita forms with the main land, as we have before stated in the description. This route also appears preferable for those who are bound to Barcelona, although there certainly can be no inconvenience in their going to the northward of Margarita.

Those who are bound to Laguayra from Cumana or Barcelona, should shape a direct course from Cape Codera, passing always between the Island Tortuga and the coast; but those who, from Europe, or any of the Antillas, are bound to that port, should navigate to the northward of Tortuga, to approach the coast about the same cape, or a little to leeward of it, taking care, if they choose to make the rock called the Sentinel, which lies to the northward of the cape. For those bound to Porto Cabello, it will not be so necessary to make Cape Codera, as any other point on the coast will answer the same purpose, provided it be sufficiently to windward of their port.

To make Cape Codera, or any harbor upon the coast to leeward of it, every one may do it in the manner that is easiest, or that he considers best; that is, he may pass through any of the straits or passages that are formed by the islands to the northward of the coast; in doing which, nothing more is necessary than to attend to the description of the one that he takes.

Those bound to Maracaybo from the east, should get sight of Cape St. Roman, and those from the westward should make Point Espada. In running for Cape St. Roman, they may pass either to the northward or southward of Curazao; and from that cape they may rung along by the coast, until they get about 2 miles to the westward of Point Macolla, which is the situation from which the course to the bar is certain, as has already been stated in the description.

Should the navigation to Cape St. Roman be made outside the islands, it should be recollected that the Roques and the Islas de Aves are extremely dangerous on their north sides; and to the end that they may be careful to keep themselves at a sufficient distance from them, especially by night, they must not forget to apply to their reckoning for the night, a correction for currents which they experience during the day, as deduced from the comparison of the dead reckoning with the points of departure and landfalls. The due observation of this remark is very important, as from what has been before stated relative to the currents, they in this place require particular attention.

Those bound direct for Santa Martha, or Carthagena, ought, unquestionably, to navigate outside all the islands, so as to make that of Oruba and the land about Cape La Vela; for, having obtained a sight of the latter, they may with safety shape a direct course for Cape Aguja, in order to reach the anchorage of Santa Martha, as before directed. We speak of the propriety of navigating to the northward of all the islands, because by so doing a more direct course may be shaped, and the distance be thereby shortened, which is well known to every skilful navigator.

Those who, without touching at Santa Martha, go on to Carthagena, will shape a direct course from Cape Aguja for the mouths of the River Magdalena, whence, by passing about 2 leagues to the westward of Point Zamba, and one and a half from Point Canoas, they may proceed direct to Boca Chica, or else anchor off Point Canoas, or on the bank of Playa Grande, if they should not be able to effect an entrance into Boca Chica with day-light. Calculation ought to be made, in order that the distance may be proportioned at the rate the vessel sails at, or the sailing of the vessel to the distance to be run, so as to reach Point Zamba, and thence take the Boca Chica by day; or anchor off Point Canoas, or on Playa Grande, in order, if possible, to avoid the necessity of hauling the wind for the night, which will be troublesome and injurious to the ship and her rigging, in the time of the hard breezes; but if there be no means of avoiding it, the situation must be maintained by short tacks off and on; or, if the wind and sea will permit, let go an anchor.

When we advise a direct course to be shaped from point to point on the coast, as Aguja, Zamba and Canoas, it is not only on account of distance, which would be greatly lengthened by following every turn of the coast, but also for the purpose of avoiding the various shoals and dangers which lie between Cape La Vela and Point Aguja, as noticed

in the description of the anchorage of the city of La Hacha, as well as those lying between Point Zamba and Point Canoas, among which we recommend no one to go with a large vessel.

If, during the season of the breezes, it is necessary to follow the route which we have described to Carthagena, from any place situated to the eastward of it, you ought, in the season of the rains, or during the vendavales, to steer true west from Cape La Vela, in the parallel of 12°, or somewhat more, in order to retain the breeze, until you get so far as 75° 45′, or 76° 15′, west longitude; and from that situation to steer south, coming up by degrees to S. E., on getting into the limits of the rains; observing also, that it is better to make the land to the southward of Boca Chica than to the northward of it; because in this season the current sets to the N. E., though in the season of the breezes they run to the S. W. Particular care should likewise be taken, not to run in upon the land by night, but only by day; for at such times the land is very hazy.

In working to windward on this coast, from Carthagena to Margarita, or Trinidad, haul close by the wind, and make the boards as long as convenient. The proper time of tacking ought to be decided by the daily variation of the trade wind, which, at about 12 at night, or somewhat sooner, comes off the shore from about E. S. E., or even S. E., if it has been raining before, and the ground is soaked; and from 9 to 11 in the forenoon, the sea breeze, or that from E. N. E., comes on. At all distances from the shore these variations take place; and the navigator may, and ought, to take advantage of them in working from leeward to windward: therefore when at night the breeze gets to the S. E. it will be proper to tack, and stretch off from land until the morning; and when the wind gets to the northward of east, he ought to tack and stand in towards the land again. And if on account of nearing the land he cannot continue on the same tack until the breeze changes, he ought to make short tacks along shore, until the breeze again changes to E. S. E., and then again stand out to sea. By these means two long stretches may always be made, one to the N. E., the other to the S. E.; that is to say, both of them within eight points of the compass. By working to windward on short tacks along shore, this advantage cannot be obtained, because the breeze always blows along the coast, unless sometimes there may be a light land wind in the night, and before the sun rises during the season of the rains; but they do not last, and such variations afford but little assistance.

Very small vessels cannot proceed upon this system when the breezes are very fresh, which from Point Aguda to Isla Fuerta are like storms, with a rough sea; so that they cannot make any way: in these cases, it is most advisable for them to keep in near the coast where the water is smoother. But large vessels, well equipped, and capable of resisting these gales, or when the breezes are moderate, ought to make long stretches when the wind will admit of it, in the manner already described.

Observations by Capt. Don Tarquato Peidrola.

On the coast of Cartagena de Indias, of which I can speak with certainty, the breezes do not begin until the end of November, and generally with little strength until the middle or end of December, from which time they are powerful, both day and night; only they frequently, but not always, moderate a little between sun-rise and nine or ten in the morning, when they recover their ordinary force. When you are very near the coast, especially if it be high, you may often find them moderate at the dawn of day, and at sunrise veer to E. N. E., until 9 or 10 o'clock, when they again blow in their usual direction, which, on this coast, is from N. N. E. to N. E. Of these variations, those who are acquainted with the coast, and sail near it, may take advantage: and it may be better, at night-fall, to anchor at the various points which offer, even for large vessels. In the season which is not of the breezes, that is, from April or May, until December, they experience the wet season, but not in the other seasons, as has been made manifest; adding, that a vessel which attempts to get to windward outside, will not accomplish it without great difficulty and damage, as much from the strength of the breeze, because the sea is very rough and short, as far as 30 or 40 leagues from the coast, when it becomes longer; and because being forced in the night to take in reefs, and that the current draws towards the N. W. quarter, it results that the little gained by tacking is lost by these causes.—These facts have been proved by continued experience.

COAST OF COLOMBIA, MOSQUITO, HONDURAS, AND YUCATAN.

From Carthagena to Cape Catoche.

[From the Derrotero de las Antillas, &c. &c.]

THE ROSARIO ISLANDS and ISLAND OF BARU, have been described in the preceding section, and it has also been noticed that the latter is separated from the main land by a narrow channel, named the Paso Caballos (Horse Pass.) The north end of the channel opens into the first Bay of Carthagena; the south end of it into the N. E. part of a great bay between the island Baru and the coast, which extends inward, north-easterly, nearly 12 miles: the points which form its entrance are, the S. W. end of the Island Baru on the west, and Barbacoas Point, on the main land, on the east. This bay is named Barbacoas, or the Little Gulf of Baru: it has several shoal spots in it, but is generally clean, with a depth of 3 to 9 and 10 fathoms, on fine sand and ooze; the most general depth being from 4 to 5 fathoms. In it there is very good shelter from the breeze; and, in entering, care must be taken to avoid the edges of the shoal ground that extends from the Rosario Isles, and not to forget the Tortuga Bank, which lies at the distance of 10 miles, S. 42° W., from Rosario Island, with 7½ fathoms water, on sand and rock.

At one mile N. 41° W. from Barbacoas Point, is a shoal, the least water on which is two fathoms; and there is another, lying S. 80° W., 2⅓ miles from the same point, with from 1½ to 2 fathoms on it: these are named the Barbacoas Shoals. Besides these, there are two others, named Atillo and Matunilla: the first lies N. 25° W., distant 3½ miles from Barbacoas Point, with the depth of one foot, on rock; and the second lies N. E. by N., nearly 5 miles from the same point, and has very little water on it.

From Barbacoas Point the coast runs about S. 8° W., 15½ miles, to the Fronton, or Bluff of Tigua: this is easily known, because a cerro or hill rises on it, which is the highest of any on this part of the coast. From this Fronton, a bank, with little water on it, extends to the north a little westerly, about 4 miles, the extremity of which, opposite to Point Comisario, (the first projecting point to the north,) extends 2½ miles from shore. From the Fronton or Bluff of Tigua, to the Boqueron or Point San Bernardo, it is 12 miles, S. 25° W. To the north-eastward of Point San Bernardo, and in the direction of the coast, are two islets; the northernmost named Isleta de Jesus, and the southern one, Cabruna; they lie respectively at 4 and 3 miles from the point.

The point of San Bernardo is the S. W. point of a drowned mangrove key; between it and the coast there is a narrow channel, called the Boqueron, frequented by canoes and pirogues. S. 20° E. from the Point San Bernardo, nearly 2 miles, lies a *rocky bank*, called the Pajarito (Little Bird Rock;) the least water on which is 3¼ fathoms, and the most 4¼ fathoms.

To the westward of San Bernardo Point lie the islands of the same name, which are eleven in number, including those of Jesus and Cabruna, already mentioned; but without including some other small islets of little consideration. The edge of the banks on which these islands are situated, extends to the westward 15 miles, and nearly 10 from north to south. Various little channels are formed between them. The depth on the bank to the west and south of these islands, is very unequal; for you may suddenly pass from shallow into deep water. All the islands are low, and covered with trees.

SALAMANQUILLA CHANNEL.—The Salamanquilla Channel lies to the eastward of the San Bernardo Islands, or rather between the bank on the E. and S. E. side of the Island Salamanquilla, and that on the west side of the islet Cabruna. Its direction is N. 47° E., and contrary, and in the narrowest part is only three-tenths of a mile wide; but the depth is from 9 to 12½ fathoms, on clay, with 5 fathoms at the edges of the banks. The banks have but little water on them, and therefore, unless precisely in the middle of the passage, there is great danger of grounding. The channel is nearer to Salamanquilla than to Cabruna; therefore it is necessary to pass nearest to the former; and if the weather be clear, the banks may be seen, by which ships may sail through with less risk; but, in thick cloudy weather, the hand lead is the only guide.

SAILING THROUGH THE SALAMANQUILLA CHANNEL.—To sail through this Channel from the north, so soon as you have passed to the westward of the Rosario Islands, steer towards the Cerro, or Hill of Tigua, bearing in mind that the *shallow bank*, called the Tortuga, lies N. 63° W. from that hill, which will be a sufficient guide for giving it a suitable berth: that is, you must not steer towards Tigua Hill when in that direction, but either to the southward or eastward of that bearing. Stand on until the easternmost of the Rosario Islands, named Salamanquilla, bears south, from which situation you may steer S. S. E., until the Hill of Tigua bears N. E.; and then steer

S. W., keeping the same bearing on; and keeping in mind what has been previously said of this channel, have persons on the lookout for the banks, which stretch off from both sides, and which, as we have before said, show plainly.

GULF OF MORROSQUILLO.—Having passed through Salamanquilla Channel, and being opposite to San Bernardo Point, you will discover the Great Bay of Tolu, called also the Gulf of Morrosquillo, which is formed by the islands of San Bernardo on the north, and the Island Fuerte on the south. The latter lies with the southernmost Key of the former bearing N. 46° E., distant 26 miles. All this Gulf has a good depth of water, there being from 9 to 23 fathoms, on green ooze; therefore a ship may anchor in any part of it during the season of light breezes, calms and variable winds.

TOLU.—Thirteen miles, S. 33½° E., from Point San Bernardo, in the bottom of the Gulf, is the town of Santiago de Tolu, situated close to the sea: this town lies 13 miles, N. 63° E., from the mouth of the Harbor of Cispata, and is in lat. 9° 30′ 56″. The land in the vicinity of this town is plain, with savannas, which extend to the north, east, and south, terminated on the east by a chain of mountains, over which there rises one mount, forming two round hummocks, named the Tetas de Tolu: these lie 12 miles to the eastward of the town, and are useful marks for recognizing the coast.

In order to pass to the westward of the islands of San Bernardo, it is necessary to keep at about six miles from the northernmost of them, named Tintinpan; and then not steer to the eastward of south, until the point of San Bernardo bears E. by N., in which direction you may steer towards it, if you choose. It is very convenient for those bound to Santiago de Tolu, to enter by the Salamanquilla Channel; and so soon as they are advanced to abreast of San Bernardo Point, they will see the Tetas de Tolu, with which mark they can direct themselves to that town. Of other hills, which are seen to the southward, the easternmost is called Santero; it bears from the Point of San Bernardo, S. 5° W., distant 21 miles; and the westernmost, named Cispata, bears S. 20° W., distant 25 miles from the same point. Near the north side of this hill is the harbor of Cispata. Cispata Hill is not so high as that of Santero: steering directly between the two, will lead direct to the entrance of this harbor, bearing in mind what was before said.

PUERTO DE CISPATA.—The mouth of Cispata Harbor lies S. 16° W., at the distance of 17½ miles from the Point of San Bernardo; and the Point of Zapote, which is the eastern point of the harbor, is in latitude 9° 24′ 19″, and longitude 75° 51′: the western points are Terraplen and Balandra, distant from each other one mile, and covered with high mangroves, extending into the water. From its mouth the harbor runs in S. 64° W., to the distance of 7 miles. This harbor is well sheltered from seas and winds, and the best anchorage is on the northern shore, between Balandra and Navios Points; the latter being very remarkable from its projecting out to the southward: the dangers in this harbor will be seen in the Plan published at the Hydrographical Office. The hills of Santero and Cispata will serve to find this harbor exactly; the middle and highest part of the former lies S. 48° E., distant above 4 miles from the Fronton, or Point of Zapote; near this hill, and to the westward of its north part, is the village of Santero, at the distance of two miles from the little bay of Zapote. The highest points of Cispata Hill lies S. 27° 30′ W., 8 long miles from the said Fronton, or Point of Zapote.

The River Sinu disembogues into the interior of Cispata Harbor: it forms almost a semi-circle towards the west and south, passing by the southern slope of Cispata Hills, including to this point, the village San Bernardo del Viento on the left bank, and the villages of San Nicolas and Santa Cruz de Lorica on the right.

From the Meztizos Point, which is the northernmost point of Cispata Harbor, the coast runs S. 81° W., S. 70° W., and S. 63° W., to Point Piedras, a distance of 17⅔ miles: in the intermediate space, and on the bearings mentioned, are found the Cienega de Venados and Punta del Viento, (Wind Point,) between which is the part where the bank extends farthest from the coast; for there it extends 3½ miles northward, and 6⅔ miles westward, with a depth of 3, 4, and 5 fathoms, on sand and rock, and also on sand and ooze.

Punta de Piedras forms a front in the direction of S. 40° W., for 3 miles: it is of moderate height, scarped, and foul at the water's edge: at its N. E. end a small bay is formed, and to the northward of it, at the distance of two cables' length, lies a little high rock, with some shoals half a mile to the N. W. of it. These shoals extend nearly a mile from N. E. to S. W., and have some rocks above water, and *others* which appear only at low water: the depth on them is from 1½ to 2 fathoms. Those who run along near this coast ought to take care and keep the lead constantly going.

The S. W. extremity of the front or bluff of Point Piedras is called Point Rada; and at the distance of five long miles S. 39° W. from it, is Punta Broqueles, low and rocky, with a reef, which extends out northward two cables' length. At a short distance from this reef lies the Toro, or Bull Shoal. Between Broqueles Point and Rada Point is the bay named Ensenada de la Rada, which has a low beachy shore; it is shallow, with 3¼ fathoms, on oozy bottom, at the distance of eight to nine-tenths of a mile. S. E. from this bay, a ridge of hills may be seen, extending N. E. and S. W., having three remark-

able peaks, the highest and largest of which lies about five miles south-eastward from Point Broqueles.

ISLA FUERTE.—The N. E. end of Fuerte Island lies S. 84½° W., at the distance of 21½ miles from Point Meztizos, and from the N. E. part of Point Piedras N. 57° W., 6½ miles. This island is one mile and a quarter in length from north to south, and somewhat less from east to west: it is high in the middle, and covered with trees and royal palms, which appear above the others. It can be approached at the south point, named Arenas Point, only; because it is surrounded by reefs, with various scattered rocks, some of which appear above water, and others do not. On the bank on the outside of the reefs, and even on them, there are from 2 to 4 fathoms water, on rock and coarse sand. Besides these banks, which surround the island, there are two other small ones: the one with 4½ fathoms water, on sand, lies S. S. W. from the island, distant one mile; and the other, with 5½ fathoms water, on sand and gravel, lies S. 28° E., distant a long mile from Arenas Point. In the channel between the island and the main land, there are from 6 to 14 fathoms water. The island may be seen from the deck of a brig or schooner, at the distance of 20 miles.

S. 49° W. from Broqueles Point, at the distance of about 56 miles, is the Point of Caribana, which is the northernmost point of the Gulf of Uraba, or of North Darien.

The intermediate coast forms bays, trending inward 6 miles, or somewhat less: and in this space is the front and hill of Tortugon, which is remarkable; the points of Arboletes, or Little Trees; San Juan and Savanilla: that of San Juan is high and scarped, the others are low to the water's edge, with beaches from one point to the other. The interior is a low range of hills, terminating near the cerros, or hills of Savanilla, which are about 4 miles S. S. E. from the point of that name. All this coast has a bank lying along it; so that, during the season of light breezes, or of variable winds and calms, ships may anchor on it, at any convenient distance from the coast, according to the size of the vessel. There are no other obstructions on it than a farallon, which lies S. 39° W., a long mile and a half from Broqueles Point; the Island Tortuguilla, which lies 16 miles S. 37° W. from the same point, and nearly west from the Fronton and Hill of Tortugon, rather more than 4 miles; and the Gigantones Shoal, which lies S. W. from Savanilla Point, at the distance of a long mile; this lying near the shore, presents no danger, except to those who run near that point, or Gigantones Point. Tortuguilla Island is low, and covered with trees: a small reef extends from it northward, with very little water on it.

CARIBANA POINT.—*Gulf of Uraba, or Darien.*—Point Caribana, as we have already said, is the northernmost point of the Gulf of Uraba: it is low, with trees on it, and surrounded by rocks close to it. It is readily known, because from it the coast trends to the south to form the said Gulf, and also by the Cerro de Aguilla, or Eagle Hill, which is near it: this hill is in latitude 8° 37′ 50″ N., and longitude 76° 56′ 30″ W.; and from it, Cape Tiburon, which is the western point that forms the Gulf of Darien, bears N. 84° W., 29 miles distant.

Aguila Hill, although of moderate height, is remarkable from being insulated in the middle of low land.

SHOALS OFF CARIBANA POINT.—The shoals off Caribana Point are at the S. W. end of the bank, already described, as generally extending along the coast; the outer corner of which, with 4½ fathoms water, is 4 miles N. W. by N. from the point.

In this extent, and nearly in that direction, there are two rocks; one, at a little distance from the point, partly shows itself; and the other, farther separated from it, with very little water on it. From the edge of the bank, in 5 fathoms, the depth increases outwards to 6 and 7 fathoms, on sandy bottom, and successively to more; so that 6 miles N. W. from Caribana Point, there are 9 and 10 fathoms, on oozy sand; at 11 miles, 21 fathoms, ooze; and, lastly, at 14 miles, 32 fathoms, also on ooze. These soundings, with the bearings of Aguila Hill, may serve to direct those who are bound to the Gulf; observing that so soon as Aguila Hill bears east, they will be entirely free from the shoals of Caribana Point, and may steer freely for the Gulf of Darien, nearly to Arenas Point, which lies 5⅔ miles S. 35° W. from that of Caribana; all this part having a good depth of water.

GULF OF URABA, or OF NORTH DARIEN.—This Gulf, as above stated, has its entrance between Caribana Point on the east, and Cape Tiburon on the west. All the eastern and southern coasts of it, to the Bay of Candelaria, offer secure anchorage at every season of the year; but the other parts to Cape Tiburon are very wild in the season of the breezes, and without any shelter, except for small vessels; but in the season of the Vendavales, when there are light breezes, variable winds and calms, you may anchor in any part of the Gulf, without either wind or sea to incommode you.

ARENAS POINT.—The north and south points of Arenas form a low front of two miles extent, and they bear from each other S. 19° E., and N. 19° W. These two points form the eastern dyke of Aguila Lagoon, which extends from thence eastward 5⅔ miles,

and is 3 miles from north to south, with various low islets in it; this lagoon commences at the southern extremity of Aguila Hill, heretofore described.

RIO SALADO.—From Arenas Point southward, the coast trends eastward a distance of 5½ miles, to the Rio Salado, and thus forms a tongue of sand, projecting into the sea, and which, although it is low, has a sufficient depth of water near it, and may be coasted at less than a mile.

From the Rio Salado the coast takes a southerly direction, with some inclination eastward: it is all low land, with hillocks at intervals; and the depth on the bank all along it is so regular, and the bottom so clean, that it may be coasted without any other care than due attention to the lead. From the Point and Hill of Cayman, which are distant from Rio Salado 14 miles, S. 14° E., the shores to the southward on both sides of the Gulf, so far as the principal mouth of the Rio Atrato, are swampy, without even one hill on it; and, from the Rio Suriguilla, which is in the southernmost part of the Gulf, to the north and west, may be considered as the Delta, where the great river Atrato, or Darien, disembogues. The Bay of Candelaria, which is formed by the swampy land at the mouths of the river, bears from the Hill of Cayman about S. 49° W., at the distance of 12 miles. For navigating all along this coast of the bottom of the Gulf, from Cayman Point on the east to the Bay of Candelaria on the west, there needs no other direction than that of attending to the lead; nor is there any danger, for a ship may be anchored wherever it may be convenient, or necessity may require.

The principal, indeed the sole object for entering into the Gulf of Darien, can only be to avail yourself of the facilities which the River Atrato affords for conducting into the interior the imports, and withdrawing therefrom the exports: thus, notwithstanding this river branches into the sea by many mouths, extending over a great distance, and forming the swampy and inundated lands just spoken of, yet only eight of them are navigable for boats and launches; and of the whole of them, not one of them offers the same advantage as the Little Faysan, or Pheasant, which discharges into the southern part of the Bay of Candelaria: inasmuch, as ships anchoring there, will be sheltered from the sea, and be near to the channel by which their freights are to be conveyed inland.

BAY OF CANDELARIA.—The coasts of the Bay of Candelaria are so very low, that the greater part of them are inundated, even at low water, and bordered with mangroves, reeds, and rushes, so that only the N. W. point of the bay appears dry. The mouth, or entrance of the bay, from the N. W. point to the S. E., where the branch called the Little Fayson falls into it, is about 2 miles in width; but there is a sand bank which borders the whole circuit of it, and extends out a mile to the S. E. from the N. W. point, which reduces the entrance to scarcely a mile in breadth. This shoal also stretches off from the S. E. point, but only to a cable's length and a half; within the bay it narrows on the south shore, but widens considerably on the N. W. side. The clear space of good anchorage is about a mile and a third each way.

Instructions for entering CANDELARIA BAY.—To enter this bay, caution and a careful use of the lead are necessary, taking care not to get into less depth than 17½ or 17 fathoms in its entrance, nor 12 within it. This caution is very necessary, because the sand bank that surrounds it is so steep, that it shoals immediately from 13 to 5 fathoms, and from 5 to getting aground. By taking care to preserve the proper depth, you will go in mid-channel, at about 4 cables' length from the S. E. point. It will also be advisable to have a man upon the lookout, on one of the yard arms, as the color of the water indicates the channel and the shoals. On the Bar of the Little Faysan branch, there are 3 feet water, and the tides rise 2 feet, throughout the whole of the Gulf of Darien.

CHOCO POINT AND ANCHORAGE.—From the N. W. point of Candelaria Bay the coast continues low, and covered with mangroves, in the direction of N. 10° W., nearly 5 miles, to Revesa Point: thence W. N. W. 7 miles, to the Tarena Keys; on all this coast the shallow bank, thrown up by the waters from the mouths of the river, extends outward. The principal mouth of the Atrato lies at about one-third of the distance from Revesa Point towards Tarena Keys; and it is necessary to keep at two miles distance from the coast. Revesa Point, which is also called Choco Point, forms a curve that presents a fine anchorage, well sheltered from the north winds and breezes; to enter it you have only to keep about 1½ cable's length distant from the south side of the point; and when you are abreast of it, or to the westward of it somewhat farther into the bay, you may anchor in 13 or 14 fathoms.

PEAKS OF TARENA, CANDELARIA DE CABO, AND GANDI.—On this coast, and to the southward of the Tarena Keys, will be seen a mount, or hill, called the Peak of Tarena, whence lies a very lofty ridge, extending to the N. W. of the various peaks of these heights: the southernmost is called Candelaria, and the northernmost, which is over Cape Tiburon, is called Pico de Cabo, or Peak of the Cape; the peak next to it southward is named Gandi.

ISLETS TUTUMATES, TAMBOR AND BOLANDEROS.—From Tarena Keys the coast runs about N. 28° W., a distance of 10 miles, to the Bolanderos: it is all

high, and there are various islets lying along it. The first of these, named Tutumates, is a group of three islets, very clean, and lying about half a mile from the coast. To these follow another named Tambor, which is separated from the coast rather more than half a mile. Although this is clean, it must be borne in mind, that at the distance of half a mile N. N. E. from it, there is a rocky shoal which shows itself, between which and the islet there is a passage: but it is always better to pass outside. To the west of this islet the coast forms a bay called Puerto Escondido, or Hidden Harbor, which, on account of its small capacity, admits small vessels only. To Tambor follow the Bolanderos, consisting of a larger islet, with other small ones at its south part; all these are clean, with deep water around them, and do not lie farther than three-quarters of a mile from the coast.

Three miles N. 55° W. from the Great Bolandero, and at the distance of half a mile from the coast, lies the Piton Islet, which is very clean; from thence N. 65° W., 6 miles, lies Gandi Point, forming a beachy bay, named Tripo Gandi. From Gandi Point the coast follows about N. N. W. for the distance of 1⅔ mile, to the point of the River Gandi, with which Gandi Point forms the bay of Estola or Gandi, where the rivers of these names disembogue; this bay is of little importance.

At N. 16° W., 6½ miles from Gandi Point, lies the Tonel Islet, very clean, with deep water, especially on its eastern side: it is rather more than a mile from the coast. From this Islet to Cape Tiburon it is 6½ miles N. 42° W. All this coast from the Tarena Keys to Cape Tiburon, is high and steep, with deep water: but it is very wild in the season of the breezes: for which reason it is most prudent to avoid it during these seasons, and to keep on the eastern side of the gulf, as it not only affords security and the accommodation of anchorage in every part, but, as there is no inconvenience arising from the sea, it is much more easy for working to windward: and much time may be saved by it.

CAPE TIBURON.—This cape, as before said, is the N. W. boundary of the gulf: it is rocky, high, and scarped: and projects out in a N. E. direction, forming an isthmus, on the south and west sides of which are two little harbors. The first of these is so narrow as to be of little importance; the second is larger, and called Miel Harbor, in which there is good holding ground, and the greatest depth is from 11 to 12 fathoms, on sand and clay.

POINT AND PEAK OF CARRETO.—Thirteen miles N. 62° W. from Cape Tiburon is the Point and Peak of Carreto, which is the eastern point of a little harbor of that name. Between the two points a bay is formed of about 2½ miles in depth, which is called the Bay of Anachucuna; all its shore is beachy to the foot of the high mountains, without any remarkable point. In the N. W. part of this bay, and at the distance of two miles to the southward of Point Carreto, is a little harbor, called Puerto Escondido, fit for smugglers only.

CARRETO HARBOR.—The Point and Peak of Carreto are, as before stated, at the eastern part of the Harbor of that name, the western part being formed by a cluster of islets of various sizes: and between these points the greatest distance is a mile and a half, but the narrowest part of the mouth is only a mile. This harbor is of a semicircular form, and extends inward about a mile; the depth of water in it is not less than 3¼ fathoms, nor more than 8 fathoms. Notwithstanding these good qualities, it is, on the contrary, open to the N. E. breezes and the seas they raise, and has little shelter from the N. W.: it is, therefore, only of use during the season of the calms and variable winds.

CARRETO SHOALS.—To the north of this harbor, at the distance of a long mile, there are two little shoals near each other bearing N. E. and S. W., with 5½ fathoms over them, on rocky bottom, and near them from 20 to 25 fathoms; with fresh breezes the sea breaks over them.

Seven miles N. 48° W. from the Point and Peak of Carreto is Punta Escoces, or Scot's Point; on this bearing there are clusters of islets of different sizes, extending out to N. N. E., a long mile, from Punta de los Islotes: to this point, which is three miles southeastward from Punta Escoces, the coast is high and scarped; but from thence to Punta Escoces, it is lower, with a beach.

CAROLINE BAY.—Punta Escoces is the S. E. of a bay, named Caroline Bay, the great islet of Oro, or Santa Catalina, being the N. W. point, bearing from the former N. 40° W., distant 4 miles: and from this line of direction, the bay falls inward about one mile and two-thirds. In the S. E. part of this bay is Puerto Escoces or Escondido, (Scottish or Hidden Harbor,) which extends inward in that direction nearly three miles, and forms good shelter. There are some shoals in it, which are represented in the particular Plan of the harbor, by which any vessel may run in for the anchorage, where they will find 4½, 5½, 6, and 7 fathoms water, on sandy bottom.

GRANDE DEL ORO, SAN AUGUSTIN, AND PIEDRAS ISLET.—The Isla Grande del Oro is high; and at one mile and eight-tenths to the south of it, there is a smaller island, called San Augustin: and on the same bearing, a little more than a

cable's length from San Augustin, is Piedras Islet, which doubtless takes its name from the many rocks with which it is surrounded.

Between Piedras Islet on the north, the west point of Aglatomate River on the south, and that of San Fulgencia to the S. W. is formed the Ensenada, or Bay of Carolina, or Caledonia, and the channel of Sasardi.

CALEDONIA BAY.—The Bay of Caledonia is, strictly speaking, formed by the points already mentioned, which bear from each other N. 25° W., and contrary, distant one mile. This bay is clean, and has a good depth of water; the greatest part of its shore is beach, and near the middle of it disembogues the River Aglaseniqua. The front or point of San Fulgencia is salient, scarped, and clean; and it also has a little bight at its western part, with little depth of water, bordered by mangroves and various keys.

SASARDI CHANNEL, S. E. ENTRANCE.—Between San Fulgencia Point, the Great Oro Island, Piedras Islet, and the Mangrove Keys which lie to the west of them, the Channel of Sasardi is formed: whose S. E. entrance, from edge to edge, is about four cables' length wide, a little more or less, and with a depth of 8 to 11 fathoms, on ooze; and farther in, from 7 to 9 fathoms; as also between the edge of the bank off Piedras Islet, and the Bay of Caledonia, the depth is from 6½ to 14 fathoms; and the space of sea between this bay and Puerto Escoces, is of a good depth; but at S. 55° E., a short mile from Piedras Islet, the sea breaks when the breeze is fresh.

These harbors are equally sheltered from the winds and seas of both seasons, and have a good depth of water; but the channel of Sasardi and Bay of Caledonia are preferable, because you can either enter or sail out from them with all winds, with more facility and less risk than you can either into or out of Puerto Escoces.

SASARDI CHANNEL, N. W. ENTRANCE.—At the distance of 4⅔ miles, N. 52° W. from the east end of the Great Oro Island, is the west extremity of two larger islands, which, with the reefs, shoals, and multitude of smaller islets extending thence to the N. W., form, with the coast, the channel of Sasardi. The N. W. mouth of this channel is formed by the said western point of the two large islands and the front of Sasardi, with an opening of three-quarters of a mile: this channel has many shoals in it, and is, therefore, of no utility; neither is there any population near it. Those who wish to enter it must have a free wind for that purpose.

Between the eastern point of Great Oro Island and the N. W. mouth of the channel of Sasardi some reefs project out, with two islets at the extremity, which bear from the said eastern point of Great Oro N. 25° W., 2 miles distant, and from the S. E. extremity of the two large islands, already mentioned, about N. E. Also, at the distance of a mile and a half to the westward of the front or point of Sasardi, there is a bank with little water on it.

The front of Sasardi is projecting, round, scarped, and surrounded by reefs close to the shore. From the most salient part of this front, the S. E. part of the Isla de Pinos bears N. 5° W., distant 2 miles; and in the intermediate space the coast forms various open bays, of little importance, the points of which are scarped, and surrounded by reefs. Off the west part of the said island is the Cienega of Navagandi, with its mouth shut by reefs; which, with the island, form a channel of 2 cables' length wide in the narrowest part, with a depth of from 1½ to 5 fathoms water.

The Isla de Pinos is high, with a hill extending along it, on which rise two remarkable points, covered with wood: its greatest extent is N. E. by N. and S. W. by S., rather more than a mile, and its greatest breadth is scarcely a mile: its N. E. and south sides are scarped, and bordered by reefs, very near the shore. The N. E. point of this island is in latitude 9° 1′ 30″, and longitude 77° 50′ 10″. At the distance of 2 miles N. by W. from the north end of the Isle of Pines, is the Isla de Pajaros, or Bird's Island, which is low, narrow, covered with brushwood, and surrounded by reefs, which have a depth of 7 or 8 fathoms close to their edges, on rocky bottom. From this point commences the immense Archipelago of the Mulatas, composed of islands, keys, shoals, and reefs, forming between them and the main land many anchorages and well sheltered channels, secure in all weathers, and terminating at Punta de San Blas. The interior of the coast is a high mountain range, with notable peaks, whose situations are exhibited in the chart of the coast, and may serve as marks to direct to the various anchorages, &c., which it comprises.

The channels which are formed in this space, are those of Pinos, Mosquitos, Cuiti, Zambogandi, Punta Brava, Cocos, Rio de Monos, Ratones, Playon Grande, Puyadas, Arevalo, Mangles, Moron, Caobos, Holandes, Chichime, and San Blas. These are more or less free, as may be seen by inspection on the chart.

A ship at the distance of one league to the northward of Pajaros Islet, and steering N. W., 25 miles, and N. 65° W., 38½ miles, will pass clear of all these dangers, and will be to the north of the easternmost keys of the Holandes Group, at the distance of 4½ or 5 miles. With these courses you will, in the beginning, pass at 1½ or 2 miles outside the reefs, and afterwards at 4 and 5½ miles; but it remains at the option of the navigator to pass at a greater distance, if more convenient.

GULF OF SAN BLAS.—Seventeen miles to the westward of the easternmost keys of the Holandes Group lies Point San Blas, in lat. 9° 34′ 36″, and long. 79° 1′ 24″. It is low, and forms the N. E. boundary of the Gulf of San Blas, the mouth of which extends N. and S. to the anchorage of Mandinga, 6 miles, and from that line an equal distance to the westward. Its coasts are low, with mangroves, which advance into the sea.

From Point San Blas eastward, to the distance of a mile and three-quarters, extend some reefs, with various keys, the easternmost of which is called Cayo Frances. From this, extending to the S. W. and westward, there are twelve other keys; and to the eastward of them are many banks and islands, which make part of the Archipelago of the Mulatas, and form various channels.

To run into and anchor in the Gulf of San Blas, whether it be in Bahia Inglesa, which is to the S. W. of Point San Blas, or at Mandinga, which, as before said, lies to the south of it, the most commodious passage is by the channel of Chichime and that of San Blas.

THE CHICHIME CHANNEL is formed to the west by the keys off Point San Blas, to the east by the reef and group of keys of Chichime, and to the south by another group surrounded by reefs, which some call Cayos de Limon, or Lemon Keys.

THE CHANNEL OF SAN BLAS is formed by the Cayos de Limon to the S. E., and those of San Blas to the N. W. The first is 3 miles in extent between the steep edges of the reefs; and the second one mile and three-quarters.

DIRECTIONS FOR ENTERING THE GULF OF SAN BLAS.—To enter this gulf it is necessary to open the mouth of the channel of Chichime, until you are on the true meridian of the second islet, counting from the westward to Cayos de Limon; from which situation steer south towards it, until abreast of, or rather before you get so far to the south as Cayo Frances; then steer S. 50° W., through the middle of San Blas Channel, which, as already noticed, is a mile and three-quarters wide between the reefs of the west south-westernmost islet of the Lemon Keys, called Gallo, or the Cock, and the reef which extends to the southward from Cayo Frances; thus directing yourself to the anchorage, whether it be to that on the north side of the gulf, or in Mandinga Bay. To proceed to the latter, the keys which lie to the north of Mandinga Point will serve for a mark. Of these, the outermost, called Cabras, lies a mile from the point; and it should be noticed, that at nearly a mile N. 10° W. from Cabras, there is a little sandy key, to which a berth must be given, and there is a bank, with 1 and 1½ fathom on it, lying N. 69° W., distant a long mile and a half from Cabras islet. The passage is between this bank and the little sandy key. The anchorage of Mandinga is sheltered, and has depth sufficient for any class of vessels. In the gulf, and extending out from the bottom of it to the distance of 3¼ miles, there are various islets, keys, and banks, the easternmost of which is called Cayo Maceta. To all of these a berth must be given, if desirous of going far into the gulf.

HOLANDES CHANNEL.—This is the largest of all the channels that are formed by the Mulatas Islands. Its mouth is formed on the east by the western extremity of the reefs of the Holandes Group, and on the S. W. by Icacos Key. The distance from one key to the other is 2¾ miles, N. 55° E., and S. 55° W., and the least depth in the channel is 14 fathoms, on a bottom of sand: but W. N. W. from Holandes Key, at the distance of a little more than 1½ mile, there is a shoal, which extends half a mile N. and S., with 6 and 6½ fathoms on it, over rocks. The sea breaks over it when there is but little swell. It may be passed either on the east or west side, but it will be always best to pass to the eastward of it, and near to the reefs of the Holandes Group, the breakers on which will serve as marks. Proceed afterwards towards the east part of Icacos Key, and give it a berth in passing. This key or island is of firm land, covered with high wood, and named from the abundance of icacos trees growing on it. From the meridian of Icacos Key, on its south side, the direction of the Holandes Channel is about S. 75° W., to the bottom of the Gulf of San Blas. It is clean, and has a depth of 21 to 25 fathoms, on oozy bottom, with a breadth of 2½ to 3 miles, between groups, detached keys and reefs, but free and commodious to turn in, in case of necessity, towards the anchorages already described.

FROM THE POINT OF SAN BLAS WESTWARD.—At N. 49° W., rather more than half a mile from Point San Blas, is the north part of its front, low, and covered with mangroves; and in the intermediate space is a little key, called Piedras, and other shoals, connected with Cayo Frances. At the distance of a quarter of a mile, N. 34° W., from the north point of San Blas, is a key named Cayo Perro, also united to the reefs extending westward from Cayo Frances, and which terminate at an island lying in front of Cienega, a mile and a quarter farther west.

From Perro Key the coast continues nearly 10 miles S. 88° W., to Cocos Point, on the east side of the mouth of Escribanos Harbor. The intermediate coast continues low, with reefs along shore, and somewhat of a bay. The most visible objects on it are Magote Point, which is small, a little salient, and has a hillock on it; that of Cerro Colorado,

which is round, scarped, and projects out but a little; and that of Playa Colorado, which is round, and surrounded by reefs, which extend out to a cable's length.

POINT ESCRIBANOS.—Cocos Point advances into the sea, and from it the point of Escribanos bears S. 80° W., one mile and a third, and in this space a bay is formed, in the middle of which is Escribanos Harbor, extending inward to the south, from its mouth, half a mile. This harbor is very shallow, having no more than 1 and 1½ fathom water. Without, on both sides, there are reefs with very little water on them; and in the channel, which is formed by them, there are from 3¼ to 6 fathoms.

ESCRIBANOS SHOALS.—To the north-eastward of the mouth of this harbor are the shoals named the Escribanos. They are two in number, and are composed of reefs with very little water on them, and lying near each other. On the reef nearest to the coast is an islet lying rather less than 2 miles from Cocos Point. This reef extends a mile from W. S. W. to E. N. E. The other lies about W. N. W. from the said islet or rock, and extends nearly a mile from E. to W. Both are steep to, with 3 and 4 fathoms water; and on the bank are from 8 to 12 fathoms, on gravel and coarse sand. In the channel formed by the south-easternmost shoal and Cocos Point, there are from 9 to 12 fathoms, diminishing to 6 and 5 fathoms on each side.

Escribanos Bank lies nearly N. W. by W. from the shoal of that name, distant 5½ miles. This extends N. 56° W., and S. 56° E., nearly 2 miles, and has from 5 to 8 fathoms water, on rocky bottom. To the northward of its edge, about 2 cables' length, from 6 to 31 fathoms are found. In heavy seas, the water breaks on this bank, which may serve as a guide; and when it does not, a lookout must be kept at the mast heads. In the channel, between this bank and the Escribanos Shoal, there are from 8 to 17 fathoms water, on sand, gravel, and rocks. The N. W. part of it lies N. 32° W., distant 8¼ miles from Escribanos Point.

TERRIN POINT.—Nineteen and one-third miles, N. 81° W., from Cocos Point, lies Terrin Point and Pescador Islet. Between the former and Quingongo Point, which are distant from each other 8½ miles, and on the meridian of Escribanos Bank, is Culebra Islet, distant from Culebra Point two-thirds of a mile, about N. N. W. Following on to the westward, the point and islet of Quengo are met with. Port Escondido, which is somewhat to the westward of this point, is only a little cienega, or lagoon. Point Chaguachagua, and that of Macolla, are the most remarkable points on this part.

The range of mountains which extends along this coast, from those of Darien to those of Porto Bello, are sufficiently remarkable; that called Cerro de la Gran Loma, or Gordo, being rather more so than the others. It lies S. 42½° W. from Culebra Islet, distant full 7 miles, and may serve as a mark for keeping clear of the Escribanos Shoals and Bank. This hill is a little higher than the Cordillera, in which it is situated. Its top is large, and of some extent.

Pescador Islet lies about 2 cables' length, N. 43° W., from Terrin Point, and the point is surrounded by reefs, which extend a cable's length to the north, and half a mile to the west, continuing to S. S. W., so as to surround three islets, which lie between that point and the N. E. point of the harbor of Nombre de Dios.

Between Point Terrin, on the east, and the Islet Martin Pescador and Manzanilla Point, on the west, the first of which bears from Terrin Point N. 64° W., at the distance of 4 long miles, and the second, N. 72° W., 5 miles, a great bay is formed, which extends in nearly 3 miles to the S. W., and to the W. and N. W., 2 miles, to the bottom of the Bay of San Cristoval. At 1½ mile, S. 49° W., from the eastern extremity of this bay, lies the western point of the harbor of Nombre de Dios, surrounded with reefs, as is also the eastern point, although at this part they extend farthest off. This harbor is small, and the greatest part of its shores are bordered with reefs and shallows. Its clear depth is 3¼, 4, and 5 fathoms, in the mouth. The other parts of the great bay of San Cristoval are useless in the season of the breezes, and the reefs from the bottom of it extend out nearly a mile towards Point San Cristoval.

From Point San Cristoval, distant 2 long cables' length to the N. E., lies an islet, called Juan del Pozo, surrounded with rocks; and about S. E. from it, at the distance of half a mile, is a bank named Vibora. Between this bank and the Islet Juan del Pozo, and between the latter and Point San Cristoval, there is a depth of 9, 10, and 13 fathoms, on gravel and coarse sand.

Point San Cristoval lies S. 88° W. 3⅔ miles from Terrin Point; also, from this point the Buey Shoal bears N. 60° W., distant nine-tenths of a mile. Between this shoal and the reefs of Terrin Point there are from 9 to 12 fathoms water, on rock, sand, and clay; and 9, 12, and 14 fathoms, on ground of the same quality, between the Buey and Vibora Shoals. The coast between Point San Cristoval and that of Manzanillo is high and scarped.

The Point of Manzanillo is the northernmost of all the coast of Porto Bello. It is also high, scarped, and projecting out, with two hummocks on it. Near this point are several islets and a shoal. The greatest of these, named Manzanillo Islet, is high and scarped, and lies four-fifths of a mile to the east. It has three farallons to the north, of

which the farthest out is distant a long cable's length. At S. 30° W. from the same islet, there are three small islets, surrounded with reefs, which extend N. E. and S. W.; and also to the east there is another small one, distant about a cable and a half; and, lastly, to the N. N. E. of the said Manzanilla Islet, at the distance of four-tenths of a mile, lies the Islet of Martin Pescador, extending about a cable's length N. and S. All these islets are high and scarped, and between those of Manzanilla and Martin Pescador there are from 10 to 14 fathoms water.

Manzanilla Shoal lies N. W. of the point of the same name, at the distance of four-tenths of a mile. It has very little water on it, and 5 and 6 fathoms close to it; and in the strait between it and the point, there are 13 fathoms water.

Among the mountains on this coast, two are remarkable, named Saxino and Nombre de Dios, and which may serve as marks for recognizing the harbor of the last name. The first, which is high, terminates in two peaks, near each other, and the north-easternmost of them is about S. 22° E. from Terrin Point, distant nearly 7 miles. That of Nombre de Dios, which is to the south of the harbor, terminates in one peak, and is distant from Terrin Point 8 miles S. S. W.

N. 65° W., at the distance of a mile and a half from Manzanilla Point, is the highest part of Tambor Islet, which is high, round, and scarped, and which is connected by a reef of two cables' length, with the northernmost part of Venados or Bastimentos Island. This island is nearly a mile in length, N. E. and S. W., and forms, with the main land, the N. E. channel of Bastimentos Harbor, the greatest extent of which, between the reefs, is one and a half-tenth of a mile, with 5 and 6½ fathoms water, on sand. This island of Bastimentos is foul on its S. E., S., and S. W. sides; and the latter, with Cabra Islet, which lies somewhat to the southward of west, forms the N. W. channel, the narrowest part of which, between the reefs, is three-tenths of a mile wide, with from 3½ to 9 fathoms, on mud. The Harbor of Bastimentos is of little importance, although sheltered, with a depth of 3½ to 7 fathoms. All its shores are bounded by reefs; and the customary anchorage is to the S. W., S., and S. E. of the south or sandy point of Bastimentos Island.

GARROTE HARBOR.—At S. 51° W. from the highest part of Tambor Islet, at the distance of 2⅓ miles, lies the mouth of Garrote Harbor, formed by the main land to the south, by Great Garrote Island in the east, and by Pelado Island, and other islets which follow to the westward one mile and a half, to the mouth of the Boquerones. The mouth of Garrote Harbor is scarcely three-tenths of a mile wide between the reefs to the west of Great Garrote Island and Pelado Islet. Its first direction is from north to south, and afterwards to S. E., with a depth of from 6½ fathoms in the interior of the harbor, to 12 and 18 in the mouth, on mud. Between this harbor and that of Bastimentos, rises the Hill of Garrote. It is of middling height, and its top terminates in a peak, at the distance of seven-tenths of a mile from the coast.

At the distance of 3½ miles S. by E. from the little bay of Garrote, is the Mountain of Capiro, or Capira, high, and almost always covered with clouds. This mountain is situated nearly east from the city of San Felipe of Porto Bello.

At a short distance to the southward of Capira is the Sierra or Mountain Ridge of Llorona, extending nearly east and west. It is the highest of all on the coast of Porto Bello. On the eastern part of its top it appears as if cut down vertically, forming a peak called the Campana, or the Bell. From this peak the ridge descends gradually to the west, to near the Peak of Guanche. The appearance of this ridge is such, that it cannot be mistaken for any other. In clear weather it may be seen at the distance of 45 miles; but in the season of the fresh breezes it is generally covered with haze; and in the season of the vandevales and variable winds it may often be seen between 8 and 9 in the morning, and 4 and 5 in the afternoon; but in the rest of the day it is covered with clouds.

The Lavandera Shoal lies N. 6° E., seven-tenths of a mile from the north extremity of Pelado Islet, and N. 85° W., distant one mile from Cabra Islet, at the mouth of Bastimentos Harbor. This shoal is of rock, with very little water on it, and steep to, with 7½ and 9 fathoms close to a rock on which the sea breaks. The channels between it and Cabra and Pelado Islets have a depth of from 14 to 17 fathoms, on mud.

BOQUERONES POINT AND ISLETS.—S. 64° W. from the highest part of Tambor Islet, at the distance of three miles and eight-tenths, lies the Point of Boquerones, which is salient, high and scarped; and from it, almost on the opposite bearing, that is, N. 64° E., there are 5 islets, called the Boquerones, which extend out about 3 cables' length. Here terminate the reefs and islets which extend westward from Pelado.

CASIQUE HILL.—Boquerones Point has to the south, at a long mile's distance, a hill, named Casique, which terminates in a point, and is of middling height. It may serve as a mark for keeping clear of the Farallon Sucia, or Foul Rock, which lies N. 33° W., nearly 2 miles from Boquerones Point. The Foul Farallon is at the west end of two groups of islets and shoals, which from S. W. to N. E., extend six and a half-tenths of a mile, forming a channel between both, with 4 to 6 fathoms water. The

north-easternmost islet, or farallon, bears N. 88° W. from the highest part of Tambor Islet, at the distance of nearly 4 miles; and in this space there are from 16 to 30 fathoms water, on clay and sand; and 16, 21, 22, and 25 fathoms, between the said farallon, the islets of the coast, and the Lavandera Shoal.

DUARTE ISLETS.—Three miles S. 69° W. from Boquerones Point, lies the north end of the Duarte Islets, which are 4 in number, and extend S. 25° E., and N. 25° W., six-tenths of a mile. From the north-easternmost one a reef extends a cable's length in the same direction. The southernmost of these islets is separated a little more than two cables' length from the Point of Duarte on the main land to the southward of it: and from that of Sabanilla, which bears N. 64° E., nearly half a mile. Between the two straits there is a depth of from 3¼ fathoms, close to the islet, to 15. The intermediate coast is high and scarped, with some bays. The Point of Josef Pobre extends farthest out, and is surrounded with rocks and reefs. Sabanilla Point has also a reef, and some rocks.

At the distance of two long miles S. 24° W. from the northernmost part of Duarte Islets, is Drake's Point, which is the N. W. point of Porto Bello. The intermediate coast is high and scarped, with a little harbor, called Leon, of very little importance, and bordered with reefs, which terminate to the N. N. W., at a little farallon, distant four-tenths of a mile from its mouth.

PORTO BELLO, or PORTO VELO.—The name of this port aptly defines its capability of receiving and accommodating ships of every class. The widest part of its entrance, which is between Drake's Point on the north, and the Islet of Buenaventura on the south, is one mile and one-fifth; and these bear from each other S. by E. and N. by W. The narrowest part between Todo Fierro Point and that of Farnesio, is rather more than half a mile wide, and these lie in the direction of S. 2° E., and N. 2° W. From the last mentioned points the harbor extends inward E. N. E., 1⅓ mile to the mangroves at its bottom. The north shore is clean; but from the south shore some reefs and rocks, with very little water on them, stretch off to between 1 and 1½ cable's length; and in the bottom, or east part of the harbor, there is a sand bank, which advances 2½ cables' length from the mangroves towards the west; and also at N. 26° W. from the city mole, one and a half-tenth of a mile, there is a very little sand bank, with 1 and 1½ fathom water on it. The rest of the harbor is clean, and sufficiently deep, diminishing regularly from 16 to 8 fathoms. Ships of the line ought to enter this harbor by warping or towing, because there are regularly either head winds or calms. The best anchorage is to the N. W. of the Battery of Santiago de la Gloria, in 9 or 10 fathoms, on clay and sand; but smaller vessels may go nearer to the city, taking care to avoid the little shoal already spoken of.

The reefs on the south shore continue to the W. S. W., and W., to the Islet Buenaventura, the N. W. point of which bears S. 55° W., three long cables' length from the point of the same name; and between this islet and the point, there are two smaller ones, all connected by reefs. S. 37° W. from Drake's Point, at the distance of one-fifth of a mile, lies the middle of Drake's Islet, which is clean all around, and has a break in the middle that appears to divide it into two parts. From this break to the west, and N. 65° W., at the distance of three-fifths of a mile, lie the south and north ends of the Salmedina Shoal. The south part consists of rocks above water, over which the sea breaks; and the other parts have from 2 to 3½ fathoms water, on rocks. There is deep water all around it, and in the channel between it and the islet there are from 11 to 26 fathoms water, on clay.

At three-fifths of a mile south from Drake's Islet, and three and a half tenths west from Point Farnesio, lies the Farnesio Shoal, of a triangular form, with 3½ to 5 fathoms water on it, on a bottom of rock. There is no passage between it and the coast; but, in the channel between it and the Salmedina Shoal, there are from 16 to 21 fathoms water, on clay.

Fresh Water.—This harbor is surrounded by high hills, from which some rills, or rivulets, descend on both coasts, and from whence vessels may procure water, particularly from that which runs into the bay to the westward of the Fort of San Fernando. According to the determinations of Brigadier D. Joaquin Francisco Fidalgo, the Battery of San Geronimo, at the city, is in latitude 9° 24′ 22″ N., and longitude 79° 43′ W.

To the southward of Porto Bello, at the distance of a long half a mile, is the Ensenado, or Cove of Buenaventura, much bordered with reefs, and consequently of little use.

To enter Porto Bello when approaching it from the north-eastward, it is advisable to approach the Farallons of Duarte, and from them to steer so as to pass at about a cable's length to the N. W. of Drake's Islet, by which the Salmedina Shoal will be avoided; but never attempt to pass between Drake's Islet and the shore. Having passed the Drake, steer to the south and east, to gain the middle of the harbor, and proceed inward in that direction, or rather nearest to the north shore.

If bound into this harbor from the southward, pass at about half a mile from the Islet Buenaventura, and thence towards Drake's Islet, to clear the Farnesio Shoal; then steer

N. E., and more easterly as the harbor opens; and lastly, run in mid-channel, or rather nearer the north side, as before directed.

FROM PORTO BELLO TO CHAGRES.—About S. 50° W., at the distance of nearly 15 miles from Drake's Point, is the western extremity of the front of Longarremos, which with the north-easternmost of the Islas de Naranjos, or Orange Isles, form a bay, in which are two creeks, called those of Minas; the Orange Isles lie N. 66° E., at the distance of 4¾ miles from Longarremos Point. The Minas Creeks are formed among mangroves, and the easternmost one extends inward 3 miles to the S. S. E., is of various breadths, and its shores are bordered with *reefs*. The western creek is narrower and shorter; it extends inward to the south rather more than a mile. At the S. E. part of the Orange Isles, which are low, covered with trees, and surrounded with *reefs*, there is an anchorage, with 4½, 6, and 7 fathoms water, on sand.

In the intermediate part of this coast, Point Gorda is the most projecting, and there are several coves of little consideration. To this point the coast is high, with banks, or ridges; and between it and Buenaventura Cove, the River Guanche disembogues; Guanche Hill bears from Point Gorda N. 82° E., distant 3¾ miles. From Point Gorda to the S. W., the coast gradually diminishes in height, and the remainder from the Point of Rio Grande and the Creeks of Minas, is a low coast, with mangroves. The Fronton of Longarremos is likewise low, with mangroves, and bordered with *reefs*, as are also the points which form the Minas Creeks; *these reefs* extend somewhat more than a cable's length off, are steep to, and at the distance of one-third of a mile there are 11 fathoms water, on clay.

MANZANILLA POINT.—From the Fronton of Longarremos, the mangroves extend to the S. W., nearly 1½ mile, to the Point of* Manzanilla, which is also of mangroves, round, and bordered with *reefs*, to the distance of a long cable, with a little *shoal*, that is distant 3 cables from it, N. W. by N.

MANZANILLA HARBOR is formed between the islet of that name to the west, and the main land to the east, extending in nearly 2 miles S. S. E. from Manzanilla Point: this harbor is clean, from 2¾ to 6 fathoms water. The best anchorage for every class of vessels is a little to the south of its mouth, and on the east coast, in 5 fathoms water, on sand and clay.

Five miles S. 68° W. from the front of Longarremos is Toro Point, which is the western point of Naos Harbor, the eastern one being the north end of Manzanilla Island, which is distant from Toro Point 2⅔ miles. Toro Point is salient, high, scarped, and bordered with reefs, extending out about two cables' length,† with an islet near them. Naos, or Navy Harbor, extends inward nearly 4 miles to the south from the middle of its mouth; its breadth is nearly equal, narrowing somewhat from two-thirds of the said distance: it is *clean* to the parallel of Point Limon, with a depth from 3¼ to 6½ fathoms water, on sand and clay; from Point Limon to the south it is shallow. As this harbor is open to winds from N. E. to N. W., round by north, it can be of use in the season of the variable winds and calms only.

From Toro Point the coast trends S. 67° W., nearly 2¼ miles, to Brujas Point, which is of moderate height, and, like the intermediate coast, bordered with *reefs*, which extend only a short distance out, but surround an islet, named Mogote de Brujas, which lies to the N. E. of the point of the same name, about 2 cables' length.

From Brujas Point the coast that follows is lower than before, and in the direction of S. 35° W., for 2 miles, to Batata, or Vigia Point, so named from having a guard-house on it: from this point that of Chagres is a cable's length distant, and is lower than the former, bordered with low rocks, which show above water, and *reefs* which extend out to a short distance.

CHAGRES.—From Chagres Point to the west point of the Penon, or *rock*, on which stands the Castle of San Lorenzo, is about 1½ cable's length S. by E. The Penon is scarped to the N. W. and south, and the Castle of San Lorenzo, as we have said, is situated on it, in latitude 9° 20′ 57″ N., and longitude 80° 3′ 53″ W. This Penon to the north, with Point Arenas to the south, form the mouth of Chagres River, which, at the widest part, is two cables' length across, and 1½ where narrowest.

To the E. S. E., at a short distance from the Castle of San Lorenzo, is the little town, or village of Chagres, consisting of huts, covered with thatch. The mouth of the river

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* SHOALS NEAR PORTO BELLO.—H. M. S. Tribune, Captain Sir Nesbett J. Willoughby, K. C. B., on the 10th of November, 1821, struck on a rock off Manzanilla Point with the Island of Bastimentos bearing S. W. by W., by compass, distant 3 miles, and Monkey Island S. E. There were 3 fathoms water on it, and 7 or 8 fathoms round it. This was accidentally omitted in its proper place. His Majesty's ship Harpy, in February, 1829, having Manzanilla Point bearing S. W., by compass, Tambor Island W. ½ S., distant 4 miles, and being about 3½ or 4 miles off shore, had only 6 fathoms water, on rocky bottom; and then hauling to the N. W., gradually deepened to 20 fathoms.

† Capt. G. S. Smith and others, say it extends off about a mile north-eastward.

narrows between the penon and bank, which extends out from Arenas Point in a N. W. direction, to the distance of a cable's length. In the mouth, and to the south of the penon, there are 2½ and 3 fathoms water; and the same depth continues, a little more or less, to the distance of half a mile up the river. To the west of the Castle of San Lorenzo, at the distance of 200 varas, or 92 English fathoms, is a *shoal*, named Laja, which extends from north to south 70 fathoms, and is of rock, with very little water on it. To enter and to sail out of this river is very dangerous, and can only be effected by very manageable vessels, which do not draw more than 12 feet: both operations must be performed with a fair wind, for otherwise the current of the river, and the various eddies it forms, from the opposition of the Penon, Laja, and the west shore, will carry vessels on either one or the other of these dangers.

From Point Arenas of the River Chagres, the direction of the coast is S. 65° W., one mile, to the Point of Morrito, or Little Hill Point; and from thence S. 38° W., nearly 2 miles, to the Point of Animas: all the shore being low with a beach.

S. 36° W., at the distance of 2 long miles from the last mentioned point, there is another equally low; and is the last point of the surveys of Brigadier Don Joaquin Francisco Fidalgo; from whence, proceeding onward, although we have various accounts, they do not merit that confidence which would entitle them to be named Directions.

Descriptions of the Coast from Porto Bello to Chagres, with Directions for Chagres and Navy Bays; by Capt. G. Sidney Smith, late commander of H. M. sloop Bustard.

"The land of Porto Bello is very high and full of hummocks, whilst all that to the westward is comparatively low, and in the vicinity of Chagres offers nothing remarkable; that to the eastward of Manzanilla Point is rather high and uniform. The Castle of Chagres, from the nature of its position, cannot be seen from the eastward until you arrive close to it.

"CHAGRES BAY.—Point Brujas forms the N. E. point of the bay, and when within 4 or 5 miles of it, in nearly an east or west direction, it cannot be mistaken; it appears to have lying off it a small island, with its sides of perpendicular rock, and top covered with bushes, which, on nearer approach, is found to be connected with the main land.—About half way between this point and the castle, (the whole of that part of the coast being steep to,) is a remarkable *white patch* in the cliff, and close to it a fine fall of excellent water: but unless in very fine weather and smooth water, it cannot be approached without danger of staving the boat. When running in for the anchorage, during night or day, after passing Brujas Point, keep it open of the point S. S. W. of it. The best anchorage for a large ship is with the Brujas Point N. E., about three miles. The Bustard anchored in 5¼ fathoms, with the flag-staff in the Castle S. E. ½ E., and Point Brujas N. E. ¾ N. A strong current sets out of the river to the N. N. E., with greater or less force, according to the season, whether rainy or dry; but at all times it prevents your riding with any great strain with northerly winds. Should it come on to blow heavy, it would be well to slip and shift round to Navy Bay.

"The Bar of Chagres Harbor, or River, has 2½ fathoms on it at low water; the entrance is rather difficult, and at all times requires a fair wind, but when in, you are perfectly secure. I would not recommend its being entered, if the measure could possibly be avoided, or to suffer the boats to be there at night. It is, perhaps, the most unhealthy place known. The Bustard's cutter was, by stress of weather, obliged to pass a night in the harbor; the consequent loss was, a lieutenant and seven men: only one of the number attacked, recovered. This happened between the 27th and 30th day of November, 1827.

"NAVY BAY is about 4 miles in depth, and 3 in breadth, open to the north, and formed by Point Manzi, which is the N. W. point of the Manzanilla Island, to the eastward, and Point Toro, to the westward. Off the latter lies a dangerous reef, extending about a mile to the N. E., which should not be approached to a less depth than 5½ fathoms water; Point Manzi, on the opposite side, may be approached with safety, by the eye, within half a cable's length. The shores of the Bay, on both sides, are bold for nearly 2 miles inward, having 3 fathoms close to the beach or bushes. The depth of water decreases very gradually between Toro Reef and the south end of the bay, being from 7 to 2¼ fathoms, so that persons may select their berth according to their draft of water; but reference ought to be had to the season of the year. In the rainy season, by far the greater portion of the year, it is best to anchor on the west side, as the winds, though variable, are generally from that quarter; and during the season of *strong sea breezes*, which are generally from the N. E., with occasional westing, it is better to anchor under Point Manzi. The latter bore from the Bustard, N. ¼ W., by compass, one-third of a mile distant, where the holding ground was found very good at 4½ fathoms water, with a little outset from the bay.

"Point Limon is bluff, and is on the west side of the bay, about three miles within Toro Point, having a hut erected on it, where there is generally a guard of a few soldiers, who communicate with Chagres by an intricate foot path; for, although the distance is

not above 4 miles, it takes several hours to accomplish it. When Point Limon is well open, bearing S. by W., by compass, the Bay may be entered with safety.

"The soundings on the coast, between Points Toro and Brujas, at a full mile off shore, are 7½, 8, 8½, 9, and 10 fathoms; and thence to half a mile off Chagres, or Batata Point, 10, 9, 7, 6½, and 6 fathoms; there are 5½, with the white patch before mentioned, bearing E. S. E.; always keeping Brujas Point just open of the point S. S. W. of it.

"Navy Bay has not a single resident on its shore, besides the guard before spoken of. Landing, except at a few places, is very difficult. Wood and cocoa-nuts are to be had in abundance: fish are scarce.

"Some persons have pointed out different spots where fresh water may be obtained; but the Bustard's boats, during her stay here, from the 30th of November to the 11th of December, 1827, were employed surveying and visiting every part of the bay; and although heavy rains had fallen, water was not to be found, except in small quantities, in stagnant pools."

Directions for Sailing from Jamaica, to and upon the Coast of Colombia, between Escudo Island and Carthagena, including Chagres and Porto Bello, by Capt. J. Mackellar, R. N., 1816.

JAMAICA TO ESCUDO ISLAND AND CHAGRES.—"The current between the Island of Jamaica and the Spanish Main, or Coast of Colombia, is not always to be depended upon as setting to the westward, as is generally supposed; for in crossing from Jamaica to the Main, ships have been known to be driven to the eastward by the current, 50 or 60 miles in 4 or 5 days; which can only be guarded against by lunar observations, or good chronometers. From the month of May till the middle or end of November, the east and N. E. trade winds seldom blow home to the Main; therefore, ships should never go to the southward of the parallel of eleven degrees, until they are 40 or 50 miles to the westward of their intended port; after which they may make a south course good, allowing half a point easterly variation, and with the winds, which in the aforementioned months blow from S. W. to W., and sometimes in the morning, after daylight, till 8 o'clock, even at south, together with the current, will set them to the eastward, and thereby gain the anchorage. If, however, upon making the land, they should find that the current has set them to the eastward of the intended port, and light winds prevail, they should immediately stand to the northward, so far as 10° 30′, or even 11°, of latitude, in order to meet the N. E. trade wind, and with it to make good the necessary westing again.

"The land to the westward of the River Chagres, within the Island Escudo, is high, and unless you are close in shore, it is impossible to discover that island; but in a clear day, a remarkable high hill will be seen to the eastward of it, which makes like a sugar-loaf. Steer in towards that hill, until you are within 3 miles of the shore, and then run to the eastward, at about that distance from it, free from danger, until you see a fort on a small bluff, which is the entrance of the river, bearing about E. by S., or E., according to your distance from the land. The mouth of the River Chagres is strongly marked, by the land to the westward forming a bluff, and the fort on the eastern side: the latter, however, cannot be seen at a greater distance than 10 or 12 miles. You have good anchorage by bringing the fort to bear E. S. E., or E. S. E. ½ E., in from 10 to 6 fathoms, sand and mud: the Sugar-loaf, to the westward, will appear about one-third above the low land between Chagres and Escudo, and the two high hills of Porto Bello open of Point Brujas. In mooring, lay your small bower to the westward, and the best to the eastward, as the offset of the river will generally keep the hawse clear during the prevalence of westerly winds." Variation 6° 10′ E.

CHAGRES TO PORTO BELLO.—"From the Road of the River Chagres to Porto Bello, the course, by compass, is N. E. ½ N.; but if you run 3 or 4 miles to the northward, then a N. E. course will take you into the harbor: the distance is about 28 or 30 miles. I strongly recommend, should light winds prevail, which is generally the case from May to the end of November, that ships bound to the eastward should get a good offing, as the current runs at the rate of from 1½ to 2½ miles an hour, to the northward and eastward, and sets right on the rocks to the N. E. of Porto Bello, particularly in the rainy months, that is, as above stated, from May to November. In this season the River Chagres has a discharge which discolors the sea, 6, 7, and 8 miles off; and this water meeting the sea current, causes a strong set to the eastward.

"If you intend going into Porto Bello, the entrance of the harbor may be known by two remarkable trees on the top of the hill, on the starboard or south side; and on a hill, on the larboard side, is a small signal post. In coming from the westward, keep within 3 miles of the shore, until you open the town of Porto Bello, on the starboard or south side of the harbor, which will lead you in; but observe, should you have light winds, to keep well up, on account of the Salmedina Shoal, which lies in a line with Drake's Islet, on the larboard hand, when going in, as the current may set you down upon it. Take care, however, that you do not shut the town of Porto Bello in with the

land on the south side, as a shoal extends off from the Islet Buenaventura, on that side. You may anchor in from 10 to 18 fathoms, on soft mud. There are no other dangers in going into the harbor, besides those stated. The Salmedina is frequently visible, and generally breaks: it is from 50 to 60 fathoms in extent, N. N. E. and S. S. W., and 50 fathoms in breadth, with 6 fathoms all round it, at 25 fathoms distance from the breakers. It bears from Drake's Islet, on the north side of the entrance, W. ½ S., by compass, distant about 300 fathoms; and between is the passage generally taken by ships coming from the eastward for Porto Bello.

"During the N. E. trades blowing home, that is, from December to May, there is no danger to be apprehended in going through this passage, as you may keep within a ship's length of the Islet, and within half a cable's length of the Salmedina; between which we found from 7 to 14, and 22 fathoms of water. In turning up to Porto Bello, great care must be taken, when within 3 or 4 miles of the harbor's mouth, that you do not shut the town in with the land on the south or starboard side of the harbor, in order to avoid the sunken rocks off Buenaventura Islet.

"There are no particular marks for anchoring; but when ships require refreshment, and supplies of water and wood, I would recommend their anchoring about a quarter of a mile below Fort Fernando, which stands on the north shore, and is easily seen; then you will be abreast of the only watering place in the harbor. In going in with a leading wind, keep the town well open on the starboard bow, and anchor in from 30 to 15 fathoms, or even in 12 or 10, according to the size of your ship.

"During the months of May, June, &c., to November, light airs prevail in the harbor, from the S. W. and W.; and, early in the morning, light winds from the N. E., down the harbor: therefore, be prepared with boats ahead, to be under way by the dawn of day. In mooring, let the small bower be to the northward, and the best to the southward."

CHAGRES TO CARTHAGENA.—"When at the River Chagres, during the months of the rainy season, or from May to the end of November, stand out to the northward, 4 or 5 leagues, so soon as you can; because the winds during these months are in general light, and the current very strong, setting directly on the rocks which lie off Porto Bello, and thence along the line of coast from E. by N. to E. N. E. and E. S. E., and seldom less than at the rate of 1½ or 3 miles an hour. Should you, however, be unavoidably drawn in near the land of Porto Bello, be constantly on your gaurd, but particularly in the evening and at night, against squalls, which frequently shift from the land, round the compass, with torrents of rain and gusts of wind so as to oblige you to clew all up.

"When you get to the eastward of Point St. Blas, and open the Gulf of Darien, the current appears to have less effect, and generally draws in to the south, S. by W., and S. by E.; but I strongly suspect that it is much influenced by the prevailing winds at the different periods of the seasons. After passing the gulf, you may see the Islands of San Bernardo, which lie to the eastward and form a cluster, the centre of which we observed to be in latitude 9° 27′ N.,* longitude, by chronometer, 75° 52′ 30″ W. These islands are low, but very remarkable, when at the distance of 10 or 12 miles off, and bearing from E. to E. by S. ½ S., several parts of them will appear like small rocks between the islands: but at the south end of the northernmost island there are two remarkable trees, which may be mistaken for a vessel at anchor. These islands, like the whole of the coast, are covered with wood, and may be seen about 5 leagues off.

"As you proceed further to the eastward, you will make the Islands of Rosario, which may always be known from those of San Bernardo, as they lie in a triangular form, and are long and low. Having passed these islands, if the weather be fine, you will see the hill over Carthagena, called Popa, on which a convent and castle with a signal-staff stands, and forms not unlike a gunner's quoin. After you get to the eastward of the Rosario Islands, you will find a current setting to the N. W. and N. N. W., at the rate of from 1 to 2½ miles in an hour.

"In proceeding to your anchorage you must steer to the northward, until you open the town of Carthagena to the southward of the Popa, which may be seen at the distance of 10 or 12 leagues off. In running in from sea, you must never bring the Popa to bear to the northward of east: either of the above marks or bearings will lead clear of the Salmedina Shoal, which has only 8 feet water on it, and bears from the Popa S. W. by W., about 8 miles.

"The anchorage of Carthagena is very good, sand and mud, and from 8 to 6 fathoms of water. Here you are about 3½ or 4 miles from the city, and may see a gateway on the face of the bay, named the St. Domingo Gate, where you may land, keeping a little to the westward, where there is a good sandy beach. In the fine season the winds generally blow along shore, and seldom bring in much sea. The marks for anchoring are,

* According to the survey of Don J. F. Fidalgo, the centre of these islands lies in 9° 45′ north latitude.

the citadel on with the lower or south part of the Popa, or the Popa E. by S. and the Boca Chica S. ½ E."

[From the Journals and Remarks of Officers in the British Navy.]

The Coast from Chagres to Boca del Toro of the Chiriqui Lagoon, by Captain John George Graham, when commander of H. M. sloop Icarus, 1824 *and* 1825.

ESCUDO ISLAND.—The course from Chagres to the Island Escudo is W. by S., by compass, about 75 miles. The island lies 9 miles from the main land, and its east end, by sights taken with two well regulated chronometers, was found to lie in 81° 29′ W. longitude. It is low, and covered with cocoanut trees, and is about 1½ mile in length, with a reef of rocks extending from each end.

Point Valencia bears from this island W. by S., 22 miles, and may be seen in clear weather. To the eastward of the point there are two small keys, named the Plantain Keys, and are covered with trees. To the westward, about 3 miles, are the three Tiger Keys, between which and the main is a passage about a mile in breadth, having from 7 to 16 fathoms water. Here the current was found setting strong to the westward.

GREEN BAY.—Six or seven miles to the westward of the Tiger Keys is the entrance of the Chiriqui Lagoon; and 8 miles S. E. of this entrance is Green Bay, where you may anchor in 10 fathoms, about a mile from the shore, abreast of an old hut in the middle of the bay. At about half a mile from the shore, the water shoals suddenly. Fresh water may be procured in abundance: it runs out of a hollow rock nearly 500 yards to the westward of the hut. There is also a pool of water close to the hut, but it is not so good as that obtained from the rock. Wood is plentiful. There are no inhabitants within 7 or 8 miles.

In working out of Green Bay, two small keys will be observed: they are named the Zapadillas, and bear W. N. W. from Point Valencia. To these a berth must be given, on account of a reef which stretches to the south-eastward from them about 2 miles, on which the water breaks in most parts.

Boca del Toro, another passage into the lagoon, is about 10 miles W. by S. from the Zapadilla Keys. This may be known by a remarkable rock, standing near the middle of the entrance. Ships going into the lagoon should keep the rock open at about a cable's length on the starboard side, until a reef appears on the larboard side, which must not be approached to a less depth than 4 fathoms, it being very steep. Pass the end of the reef in 7 fathoms, and haul up for the bay, where you may choose your anchorage in from 8 to 4 fathoms, well sheltered.

The only supplies to be obtained here, are turtle, fish, and wood.

The Chiriqui Lagoon, by Douglas Cox, Esq., commander of his Majesty's sloop Sheerwater, in 1819.

[The courses and bearings are magnetic.]

Chiriqui Lagoon is about 26 miles long, and in some places 12 or 13 miles wide, with several rivers falling into it. The principal entrance into this lagoon is called the Valencia Channel, which is about 2 miles wide, lying north and south, with from 23 to 14 fathoms water. Its latitude is about 9° 16′ N., and longitude 81° 58′ W. The western side of this channel is formed by the Zapadillas and Water Key; the former having a reef on the north side of them, from the S. E. end of Provision Island to about 2 miles S. E. of the easternmost Zapadilla Key. Off the east end of Water Key, a reef extends about half a mile. The eastern side of the channel is formed by the Tiger Keys and Valencia Point. The Tiger Keys lie 1½ mile from Valencia Point, and are four* in number, three having trees on them, and the fourth perfectly bare, to the S. W. of which is a rock just even with the surface of the water. On this the sea always breaks, and there are 17 fathoms within half a mile of it. There is little or no danger in going into this channel, by keeping a good lookout from the mast-head, until you get within Water Key; then there is a rocky bank with 11 feet on some parts of it. The marks to avoid this bank, is to keep the two Zapadilla Keys open of the east end of Water Key, N. N. W. ¾ W. In going across to the south side of the lagoon to Chraco Mola River, the soundings are very irregular, there being in some places not more than 3 fathoms. By observing the following directions, you will not have less than that depth.

When abreast of Water Key, steer to the southward until you bring the two Zapadilla Keys just open of the east end of Water Key, bearing N. W. by N.; keep them on that bearing until the small keys which lie off Valencia South Point come on with the North Valencia Point, and you will have from 18 to 5 and 6 fathoms; then steer to the W. S. W., until the eastern Zapadilla Key comes within half its breadth of the east end of Water Key, bearing N. N. W. ¼ W., and keep it thus open, or in that direction, until

* Capt. J. G. Graham notices only three.

the North and South Valencia Points appear in a line. You will then be on a bank of three fathoms, which is about half a mile wide: and when over it, the water will deepen fast to 10 and 12 fathoms. When you are on the bank of three fathoms, Chraco Mola River will bear about S. E., 4 or 5 miles distant. It is not perceptible until you are within 2 or 3 miles. Nine fathoms is near enough to approach on the river side. It has, however, two entrances. The best anchorage is off the northernmost, in 9 or 10 fathoms, on muddy bottom, with Valencia Point bearing N. by W. ½ W., and the east end of Water Key N. W. ¾ N., or you may go farther eastward, in 9 fathoms.

At the head of the river a tribe of Indians live, from whom you may purchase hogs, fowls, and plantains, by going up to their village, about 25 miles. The water is perfectly fresh at a quarter of a mile from the sea.

There is very good anchorage on the south side of the Zapadilla Keys, in 12 or 13 fathoms water, about one mile off either of them, and little danger in going in there, by giving the reef off the S. E. key a berth of about a mile. Your eye will be the best guide for you here.

The north entrance of the Chraco Mola River is in latitude 9° 1′ 36″ N., and longitude 81° 54′ 18″ W. Variation of the compass 5° 50′ E.

Remarks on the Coast of Nicaragua, by Sir William S. Wiseman, when Commander of H. M. S. Sophie, in May and June, 1820.

[The courses and bearings are magnetic.]

In his Majesty's sloop Sophie, we made the coast of Nicaragua, about 30 miles to the eastward of the River San Juan, and close to the River Tortuga. Near the latter is the most remarkable land on the coast. It is a high hummock, shaped at the west end like a gun quoin, and called the Turtle Bague. The land to the eastward, as far as I could distinguish, was very low, and perfectly level. To the westward it was the same for about 10 miles, where there are three hillocks rising inland near the River Colorado. From this to Point San Juan, it is uniformly level, very low, and covered with trees. We sounded in 50 fathoms, on blue mud and small shells, at about 10 or 11 miles off shore. The wind variable from N. to N. E., a current running to the S. W. about one mile an hour. Off this part of the coast, particularly after rain, the water will be much discolored for a considerable distance from the land; and if the wind blows on shore, you will often observe a ripple that has the appearance of broken water, which is occasioned by the outsets from the many rivers on the coast; but the soundings are very regular, there being 9 and 10 fathoms from 3 to 4 miles off shore. Nevertheless, at night it would not be prudent to go into less than 7 fathoms, as the currents are constantly varying, but mostly set on shore. The anchorage is good all along this part of the coast, generally blue mud and clay.

Point San Juan bearing N. W. by W., distant about 5 miles, has the appearance of the North Foreland. The land, though low, is thickly covered with very high trees, which gives it a bluff and bold appearance; but it should not be approached within a mile, as I observed the breakers extending half a mile or more from the point, in a northerly direction. Standing towards Point San Juan from the eastward, many remarkably high trees are seen; one in particular, stripped of its branches, has the appearance of a vessel's mast, and may be seen at a considerable distance.

From Point San Juan the land takes a south-westerly direction to the mouth of the river, and as near as I could judge, about 8 or 10 miles. You may run along in 8 or 9 fathoms, about 2 miles off shore, till abreast of a low sandy point on the larboard hand, at the entrance of the river, when you may haul round at about a cable's length from it, in 5 and 4½ fathoms. On the starboard hand, just within the river, at about 3 cables' length from the point, there is a bank with only 4 or 5 feet on it, which you may plainly distinguish from the ship. We anchored in the Sophie about a cable's length within the river, in 4½ fathoms water, on blue mud.

I did not observe any shoals or dangers upon the coast, or near the River San Juan. The soundings are regular, and a good lookout, with the lead constantly going, are, in my opinion, the principal requisites for approaching this coast.

There are no inhabitants at or near the river, but the Spaniards have a guard of a sergeant and twelve soldiers at a short distance within it, to prevent boats going up without a passport from the commandant at Grenada.

Very excellent fresh water, and plenty of wood, may be easily procured; and there appeared to be abundance of fish.

From Chagres to Cape Catoche.

[Continued from the Derrotero.]

The description which we have given of the coast thus far, we have presumed to call by that name, because we can safely say that the data from which we have compiled it,

is essentially good, and therefore contains no error but of a very trivial nature: but hence proceeding onward, we cannot speak with equal certainty, and therefore have thought it necessary to apprize the navigator with the distrust with which we proceed. And although the general course of the coast may be considered as moderately exact, yet we are in want of the details that are indispensably necessary for coasting along the shore. Therefore, until correct charts come to hand, we shall content ourselves with giving such information as appears to us to approximate nearest to the truth, and which may be sufficient to enable mariners to make those points of the coast that are most frequented.

THE COAST BETWEEN PORTO BELLO AND VALENCIA POINT.—From the last low point without a name, of the surveys of Brigadier John J. F. Fidalgo, the coast trends about S. 70° W., a distance of 53 miles, to the River Belen, from whence it bends N. 55° W., 8 leagues, to Point Escudo; and thence it runs west another eight leagues, to Valencia Point. All this coast is generally low, excepting some parts which rise a little: and the water is deep, so that at the distance of 3 or 4 miles off, there are from 20 to 40 fathoms, the bottom being chiefly mud and sand. Several rivers disembogue upon it, two of which, besides Chagres, namely, that of Indios and that of Coclet, are navigable, and have communication with the interior. The river Coclet is 42 miles to the westward of Chagres; and between them are 4 remarkable mountains, two of them inland, and the other two on the coast; and as they may serve for recognizing the land by, we give a description of them.

1. The Caladeros Altos of Chagres, are two mountains situated on the River Chagres, and some distance inland. They lie E. N. E. and W. S. W.,* and appear separate from each other, as you come from Porto Bello. They seem only as one when they bear S. E., and thus apparently united, they have the same bearing from the Castle of San Lorenzo, at Chagres; therefore, those bound to Chagres, from sea, have only to bring these two mountains in one, and steer S. E. for the port.

2. The Pilon of Miguel de la Borda is a single mountain, so named from its resemblance to a sugar-loaf, which is seen inland, at about 9 leagues to the S. W. by S. from Chagres. When this mountain bears S. by W., it will be in a line with the River Indios, which is 5 leagues to the westward of Chagres.

3. The Sierra of Miguel de la Borda is of moderate elevation, and rises upon the same coast. It extends north and south, and is 13 leagues to the westward of Porto Bello.

4. The Sierra of Coclet, which is somewhat lower than the former, lies to the S. S. W. of the River Coclet.

The Cordillera of Veragua and Serrania of Salamanca.—Besides the mountains above described, there are others about 7 leagues inland, very well known, and celebrated for their great elevation, named the Cordillera de Veragua, which commence nearly to the south of the River Coclet, and unite with the Serrania of Salamanca, nearly on the meridian of Bocas de Toro, which ends a little to the westward of the meridian of the River Matina. Both are so elevated as to be seen 36 leagues out to sea, in clear weather. At the east end of the mountains of Veragua, there is a gap resembling a riding saddle, and is called the Silla, or Saddle of Veragua, and which lies south from the River Coclet. Therefore, to find that river from sea, you have only to bring the Silla to bear due south, and steer in for the shore. To the westward of the Silla there is a mount on the highest top of the same Cordillera, of the figure of a house or castle, and is called the Castle of Choco, from which the island named Escudo de Veraguas, (Shield of Veragua,) bears N. 38° W. Therefore, when the mount bears S. 38° E., the island will be found by steering in that direction.† Upon the west end of the same mountain, may be seen a remarkable peak, called Pan de Suerre, so called from the village at its base. This may serve as a mark for finding Matina.

The Island of Escudo is low, covered with cocoa and other trees, and surrounded on the east and north parts with various keys of a chalky clay, also covered with trees. From the east side a reef extends off about half a league, on which the sea generally breaks. All the island and its keys are surrounded by a bank of sand and gravel, which extends out about 5 miles, on which, and very near to the land, there are 4½ fathoms, and the depth gradually increases outward. The island is situated about three leagues from the main land, and in case of emergency, water may be procured from its various rivulets, but not without considerable trouble, from the scantiness of the streams, and from their distance above the beach. On the S. and S. W. sides of this island there is good anchorage, sheltered from the norths and the breezes. There is also anchorage on the bank to the eastward, but this is not so commodious as the other, not only because

* We presume this should be N. W. and S. E.

† By another chart, the bearing is N. 2° W., and S. 2° E.; but as we have not the means of ascertaining which, or if either, is correct, we advise the navigator to use it with caution.

it is not sheltered from the breeze, but also because the bottom is rocky, and may chafe the cables.

From Point Valencia, already noticed, and which, according to the pilot Patino, is situated in 9° 13′ of north latitude, the coast forms a great bay, shut in by various keys and islets, which extend from that point, W. N. W., a distance of 14 leagues, to Punta Gorda de Tirbi. This great bay is separated into two parts, by several interior keys. The eastern part is called the Lagoon of Chiriqui, and the western part Almirante Bay. They are connected by various arms and creeks, of little depth of water. The Lagoon of Chiriqui may be entered through the channel which is formed by Point Valencia and the easternmost keys of the group; and, according to our information, although shallow, there is depth of water sufficient, both in the channel and within the lagoon, for vessels of all burthens. Almirante Bay must be entered exclusively by the channel which is formed by Punta Gorda de Tirbi and the westernmost key. In this mouth, and within the bay, there is, from the same authority, depth of water sufficient for all classes of vessels. This channel is called the Dragon's Mouth, Boca del Dragon, to distinguish it from another more to the eastward, called Boca del Toro, by which only small vessels can enter. Within both bays the anchorage is as well sheltered and secure as the best harbors; but as we possess no information respecting them, we shall say no more than that to enter in or go out by the Dragon's Mouth, you should give a good berth to the western coast, or that of Punta Gorda de Tirbi, on account of a rocky reef that runs out from it to mid-channel.*

The pilot Patino places the northernmost key off Point Valencia, called Zapadilla, in latitude 9° 15′ 30″ N., and the northernmost of those of the Island Bastimentos, in 9° 29′.

COAST BETWEEN PUNTA GORDA AND SAN JUAN DE NICARAGUA.—From Punta Gorda de Tirbi, the coast trends about N. 56° W., a distance of 14 miles, to Point Carreta, which is the eastern point of a bay that falls into the S. W., W., and N. W., a distance of 13 miles, to Blanca, or White Point, which has an islet near it. Thence the coast trends N. 3° W., 26 miles, to the Point of Arenas, which forms the Harbor of San Juan. All this coast is clean, and the water deep, and several rivers disembogue in it, of which the principal is that of Martina, or Port Cartayo, or Cartago, and that of San Juan. The last discharges its water by several mouths, one of which enters the very harbor.

SAN JUAN DE NICARAGUA.—The Harbor of San Juan, or St. John, is formed by a low island, which, with the coast, encloses an extensive bay. On the east part the island is nearly joined to the main land, and the entrance to the harbor is on the west. The west point of the island is called Arenas Point, which is situated in 10° 56′ N. lat. The bay is very spacious, but is incommoded with a large bank, with little water on it, which limits the extent of the anchorage to 5 cables' length from north to south, and to 2½ from east to west.

To take the anchorage, you have only to coast Point Arenas at the distance of a half, one, or one and a half cable's length, according to the ship's draft of water, and proceed inward towards the east, so as to take the round of the point, with an understanding that at a cable's length from the south coast of the island, which is where you ought to anchor, there are 4½ fathoms water. The lead is the best, in fact the only guide, into the harbor. Vessels in it are securely sheltered, there being no sea to occasion inconvenience, except when the wind is in the N. W. quarter, which is common on this coast, from September to the end of January or beginning of February.

The mouth of the River St. Juan is exactly on the meridian of, or true south from, Point Arenas, and by it there is a communication with the Lake of Nicaragua. A little to the east of Point Arenas, upon the island, are some pits, or wells, where fresh water may be obtained: it may also be procured in the river.

From the Harbor of San Juan de Nicaragua, the coast trends to the north, a little easterly, a distance of 80 leagues, to Cape Gracias a Dios, (Thanks to God,) and what is properly called the Mosquito Shore. It is all low land, for the high lands terminate at St. Juan's; and in this extent there are numerous rivers and lagoons. A bank of soundings extends all along it, being about 8 miles from the shore, at Point Arenas, and running off in a north-easterly direction, into latitude 16° 33′ N., and to longitude 81° W.

Upon this bank there are a number of keys and reefs, and those of Cape Gracias a Dios are very dangerous. Of them we possess no written description, but we may remark that this coast has been recently surveyed by order of the British Admiralty, by Capt. R. Owen and Lieut. Barnett, and that the results are published on the General Chart of the West Indies, 1837, E. & G. W. Blunt.

COAST BETWEEN ARENAS POINT AND THE PIGEON KEYS.—North of Point Arenas, 40 miles distant, is Point Gorda; the coast between forms an extensive

* See, however, another account of this lagoon, and some other places, given hereafter.

bay, called the Gulf of Matina. About Point Gorda, and near it, are several islets, which, with the coast, are clean; and the soundings are so regular, that no other guide is necessary than the use of the lead.

From Point Gorda the coast trends to N. about 3 leagues to Point Monos, S. E. of which there are several keys, very clean; and between them and the coast there is an anchorage in 3 fathoms water: this anchorage ought to be entered from the southward of the islets. To the N. N. E. of these islets there are others, which rise upon the bank and reef, called the Pigeons, extending about 12 miles from north to south. To the eastward of all these, and without the bank, lies a key, which, with the Pigeons, forms a channel; but it is best to avoid it, by sailing on the outside, as the Pigeon's Reef will thereby be entirely cleared, although it extends about 2 miles north from the islands.

BLUEFIELD'S, or BLEWFIELD'S LAGOON.—Abreast of the Pigeon Keys, on the coast, is the southern point of Bluefield's Lagoon, which is a bay extending inland to the westward, about 10 miles, and receiving in its northern part a considereble river, called Rio Escondido. From the southern point of the bay, or lagoon, to the northern one, called Bluefield's Point, the distance is 13 miles, N. N. E.; the latitude of this point is 11° 56′ 20″ N., it being the mean of several observations. Nearly on the line, between the two points, is a key 11 miles in length, which forms, with the points, two channels: of these the northern is the principal one, and has, in the season of the breezes, about 2 fathoms water; but at that season it is dangerous, because there is a fall (alfada) of 3 feet. In the time of the vendevales, or rainy season, there are 2½ fathoms, without any fall, or alfada.

Having passed the bar, or channel, there are within the bay 5 and 6 fathoms water, upon clay: the anchorage is near the town, on the N. E. side. To enter the lagoon you have only to keep along by Bluefield's Point, at the distance of a stone's throw, for it is very clean; and the point may be known from its being the highest land on this part of the coast. When within, continue on near the north shore, for the south is very foul, and requires the utmost caution: it will be indispensably necessary in going up to have anchors and cables all clear, to let go at an instant when the current, which is moderately strong, may render such an expedient necessary.

PEARL LAGOON.—From Bluefield's Point the coast trends north, inclining a little to the west, for the distance of 18 miles, to the entrance of the Pearl Lagoon. Off this part of the coast is a key, called the Cayman, lying at the distance of 7 miles from Bluefield's Point, and somewhat more than half a league from the shore. A reef extends from the north part of this key to the distance of 4 miles; but as every vessel ought to pass to the eastward of it, there can be no danger if the lead be kept going. The entrance of Pearl Lagoon has deeper water than that of Bluefield's: there is also anchorage on the outside of it, under shelter of the north coast, which rounds to the N. E., a distance of 11 miles, to Point Loro.

To the eastward of the Pearl Lagoon, and well out from the coast, lies the Pit Key, which is 7 leagues from it; the Lobo Marino, or Sea Wolf Key,* which lies 12 miles N. E. by E. from Pit Key; and lastly, the Islas de Mangle, or Corn Islands, which lie about 12 miles to the eastward of the latter.

The Pit and Sea Wolf Keys are somewhat foul, and should not be approached nearer than half a mile: they are dangerous to navigation, because having 14 fathoms about them, and no bank near them with less depth, the soundings will give no indication of their proximity in the night, or in thick weather. The channels which they form with the Corn Islands and the coast are clean and free.

[The courses and bearings are magnetic.]

ISLAND OF ST. ANDREW.—On the 1st day of September, 1818, his Majesty's sloop Beaver anchored in a fine bay or cove on the west coast of this island; of which the following information was obtained while lying there. The bay is spacious and clean, sheltered from N. by E. round by E. to S. by E.; and it appeared that a S. W. wind would not send in much sea. The bottom is rocky without the depth of 7 fathoms; so that you must run in until you get upon the white bottom, which consists of white sand, and bounds the bay, stretching off a long mile, having good anchorage on every part of it. The Beaver laid with a small inlet laying nearly east, distant three-quarters of a mile off shore; the north point of the bay bearing N. by W., and the south point S. by W. ½ W., in 6¾ fathoms.

No other directions are necessary for entering this bay, than to steer directly in, and anchor where convenient. To find the situation of the bay from the offing, look out for the highest part of the island, near the south end, on which are two cocoanut trees, very conspicuous by their overtopping the other trees, and by being the only cocoanut trees

* According to various modern charts, these two keys appear to be of doubtful existence; but we do not venture to alter these directions until we have better accounts and data to convince us of it.

that show themselves on the high land: bring them to bear N. E., or N. E. by N., and you will find the bay by steering in that direction.

It is flat to the distance of 2 cables' length from the north point, with no more than 2 and 3 fathoms, deepening suddenly to 8 fathoms; but this lying so near the shore, is out of the way of sailing in from the southward. But if from the northward, running along shore, with a scant N. E. wind, it will be necessary to give it a berth, going no nearer to the shore than 8 fathoms; and keeping the south point of the bay a little open of the larboard bow bearing nearly south; and when the two cocoanut trees come over a remarkable withered tree which stands near a sandy place on the point, bearing about N. E., you will have passed the point of the flat, and may haul in S. E. for the anchorage. We sounded the north shore, and found 5 fathoms close to; so far as we sounded the bay was all bold and clear.

There is an inlet in the N. E. corner of the cove, which would answer for a careening place for small vessels; it is also a snug harbor for boats. At the entrance it is 27 fathoms wide, and has 4½ fathoms water; but this depth does not continue more than a cable's length, when it shoals to 3, and then suddenly to 6 feet. Two brigs and a frigate might be moored in the entrance, in which situation they would appear as in a wet dock, having hawsers made fast on shore from their bows and quarters; but a vessel must be warped in stern foremost, having a bower anchor a cable's length to the westward, as a security against the winds from that quarter, which blow right in. The north part of the cove is also a good place to moor ships, having a bower anchor towards the sea; they might be moored with their sterns to the shore, by the stream cable, or a good hawser.

The island in general presents a level fertile appearance; it is of moderate height, and may be seen 18 or 20 miles off: when seen from the eastward, it makes in two hummocks, of which the north one is the highest. As we sailed along the east coast, we observed it to be bounded by a reef, which appeared to extend off 4 or 5 miles; the south point of this reef, with the shore inside of it, forms what is called the Eastern Harbor, the entrance of which is from the southward. The north end is very dangerous, having a low key with a reef off it, on which the sea breaks as far as can be seen from the deck, probably 7 miles; it joins with the eastern reef, and they together encompass all the north end and two-thirds of the east side of the island, ending a mile or so south of the entrance to the Eastern Harbor.

The south end is bold, as is the west side; you may anchor in a bight near the shore to the northward of the cove, near some chalky cliffs: we got soundings of 9 fathoms in it, but the ground was coarse. There are no soundings until you come very near the shore.

From the hills you can see the E. S. E. Keys, which lie 7 leagues from St. Andrew's; the S. S. W. Keys 10, and Old Providence 18 leagues.

The currents about these islands are very irregular, setting occasionally in every direction, but genarally to the northward and southward. In going there, we experienced a strong easterly current; in returning, a southerly one: and a vessel had arrived from the Indian coast a short time before, having had calms nearly all the passage, and was brought along by a strong N. E. current.

THE S. S. W. KEYS are the southernmost and westernmost of the keys around St. Andrew's Island, being S. by W., 20 miles, from the south point of St. Andrew's Island. These are three islets, which afford good anchoring ground, and so clean that there is nothing to be guarded against, except what is in sight; for although there are a few rocks round them, they are too near to be of any interruption.

THE E. S. E. KEYS.—About E. ½ S. from St. Andrew's Island, at the distance of 5 leagues from the south end of it, there are three keys, called the E. S. E. Keys. They are surrounded by a reef and a bank of 7 miles in extent, which is very dangerous, and although there is anchorage for small vessels on it, it is necessary to have a pilot.

LITTLE CORN ISLAND lies about 20 leagues W. S. W. ½ W. from St. Andrew's, and has a reef round the east side of it, about a mile from the shore. The island appears to be all savanna, bordered round the beach with trees: all round the east side there are a great number of cocoanut trees. There is good anchorage in a bay on the S. W. side of the island, where you may lie sheltered from north winds; from the north and south points of the bay there are reefs run off to the distance of 2 cables' length, but there is good room to work in, and regular soundings. You may anchor in 3 or 4 fathoms, sandy ground, at about a mile from the shore. In approaching this bay from the northward, it is necessary to give the north point of the island a berth of a mile, in order to clear the reef. The tide rises and falls about 3 feet, and there was a current off the bay setting to the southward, but not very strong. Latitude of the bay by observation is 12° 17′ N. Variation of the compass, 9° 20′ E. At the Porcupine's anchorage, the south point of the bay bore E. S. E., and the north point N. W. by W.

GREAT CORN ISLAND.—This island lies S. S. W., 10 or 11 miles from Little Corn Island: it has a reef off the N. E. end of it, that runs along the east side, about a

mile and a half from the shore. The N. W. part of the island is pretty bold; in the N. W. bay, called the Brigantine Bay, there is good anchorage with the sea breeze, but no shelter from norths. There is another, called the S. W. Bay, where we anchored in 3 fathoms. Off the point between the two bays lies a very dangerous ledge of rocks, stretching from the point to sea, nearly east and west, about 2 or 2½ miles, and having from 10 to 13 feet water on it: it does not appear to be more than 2 cables' length across in any part, and on the outer end there is a spot with only 9 feet on it, where the sea broke when it blew strong. Over this ledge we were carried by the unskilfulness of the pilot, and beat our rudder off, close by the point, where I think we had the best water; this ledge breaks off the sea from the bay, when the wind is to the westward of north. In going down the west side of the island for the bay, it is necessary to give these rocks a good berth, and not haul in for the bay till the S. W. point of the island bears about E. S. E.; but, by keeping a lookout from the mast head, you may see the rocks and round them, taking care to go no nearer to them than 6 fathoms: you may then work up into the bay, the soundings being regular from 6 to 2¼ fathoms, on a fine sandy bottom. You may sail along on the outside of the reef to the eastward of the island, and go round the S. E. point, which is pretty bold; then haul into the bay, and fetch farther to windward than by going to the westward round the ledge. The Porcupine lay in 3 fathoms water, about half a mile off shore, with the north point of the bay bearing N. by W., and the S. W. point S. E. ½ S. We always found a great swell in the bay, setting from point to point, whichever way the wind blew; but it had been constantly blowing strong without. The patch of 9 feet on the outer end of the ledge, where the sea broke, bore W. by N. from the anchorage. The latitude observed at the anchorage is 12° 13′ N., and the longitude 83° 3′ W. We observed a regular rise and fall of the water by the shore; but the current off the bay ran moderately to the southward.

This island is very conveniently situated for those bound to the Harbor of Bluefields, which bears from it W. by S., distant 14 leagues, and which it is very dangerous attempting, in blowing weather, with the wind on shore, as there are only 12 or 13 feet water on the bar; but here, as was our case, they may stay in safety till the weather settles, that they can get in.

DANGEROUS ROCK.—To the southward of the Great Corn Island, at the distance of about 7 miles, there is a rock which appears above water, and the greatest caution should be taken to avoid it; for we do not believe that its situation is correctly known, and even if it were, it would still be dangerous to navigation at night, or in thick weather.

THE ISLANDS OF SANTA CATALINA AND PROVIDENCE, separated only by a narrow channel, may be considered as one island. They are situated about 15 leagues N. 23° E. from St. Andrew's. Catalina is scarcely any thing more than a rock, extremely craggy, and mostly covered with stones. The highest parts of it are excessively irregular, so that it is of no value, and is therefore uninhabited. Providence is about 4 miles in length from north to south, and 2 from east to west. From the level of the sea, at the most salient points, it begins to rise with a very gentle aclivity, towards the centre, where, resembling an amphitheatre, it forms four hills, crowned by a high mountain. From the summit, or cusp of the easternmost hill, four streams descend from the same source, and run down to the shore in different directions, subdividing in their course into smaller rivulets of most excellent water. The most abundant of these streams in the dry season, is that which runs down on the west side, into what is called Freshwater Bay, Ensenada de Agua dulce. In clear weather the island may be seen from 10 to 12 leagues off. It is, as well as Catalina, surrounded by a reef, that will not admit of coming within a league of it, and on the north side, not nearer than 4 miles. It is inhabited by three or four families, who cultivate some portions of it. Vessels not drawing more than 10 or 11 feet, may get in between the reefs, but it is necessary to have a pilot for the purpose.

MUSKETEERS.—This shoal, of which we have no written description, is dangerous, and has an extent of 8 miles, in a north-westerly direction. The centre lies in 13° 33′ N. lat., and 80° 03′ W. long.

QUITA SUENO.—This is an extensive bank, of 35 miles in length from north to south, and 13 miles in width from east to west, having on it from 7 to 20 fathoms water, excepting on the eastern edge, which is dangerous, being a range of shoals and reefs, for an extent of 23 miles, ranging nearly north and south.

South point of the bank is in.....	14°	2′	N. lat.,	81°	15′	W. long.
North point.....	14	37	"	81	7	"
South point of the shoal ground.....	14	7	"	81	7	"
North do. do. do.	14	30	"	81	7	"

SERRANA.—East, 52 miles from the eastern edge of Quita Sueno, is the Serrana Bank. It is of a triangular shape, longest from N. E. to S. W., being 20 miles long; on which point there is a key. The N. E. and S. sides are bounded by reefs.

North point	14°	28′	N. lat.,	80°	17′	W. long.
East point	14	24	"	80	8	"
S. W. point	14	16	"	80	23	"

SERRANILLA.—This is a bank of 25 miles in extent from east to west, and 20 miles from north to south, of different depths, from 3 to 30 fathoms. The S. E. side is a range of keys and breakers; the western side is clean and clear, with the exception of one small spot, called the Western Breaker.

The N. E. Breaker, which may be called the N. E. point of the bank, lies in	15°	47′	N. lat.,	79°	42′	W. long.
The west point of the bank, in	15	45	"	80	7	"

THE NEW SHOAL is a bank extending about 13 miles from N. E. to S. W., and 7 from east to west. All the eastern part is a reef, very steep to; but on the west side the depth diminishes gradually. On the bank, at a mile and a half from its northern extremity, there is a sandy key, situated in latitude 15° 52′ 20″ N., and longitude 78° 33′ W. Three or four miles W. N. W. from this key, you may anchor; but take care not to get into less than 9 fathoms water, because at 2½ miles W. N. W. from it, a rock has been found, with only 7 feet water on it; and S. by E. from it, at the distance of a mile, there is another, with no more than 4 feet water on it. Both of them stand in 5 fathoms. They are very steep, and not larger than a boat.

THE BAXO DEL COMBOY does not exist; for particular search has been made for it, but it could not be found.

The above have all been surveyed by Capt. R. Owen and Lieut. Barnett, and are published in the General Chart of the West Indies, by E. and G. W. Blunt, 1837.

GREAT RIVER.—From Point Loro, already mentioned, the coast trends about north, a distance of 27 miles, to the Rio Grande, or Great River. This part of the coast is very foul, with a reef which stretches off from it about 6 miles. On the southern edge of the reef, and east from Point Loro, there are two keys, the easternmost of which is called Marron. To the north, a little westerly from this key, and at the distance of 9 miles, there is another, which is outside the reef. Without these two keys there are others, of which the southernmost are called the Pearl Keys. To these follow three others, called the King's Keys, which lie east from the mouth of the Great River, at the distance of about 13 miles. Finally, to these follow the Mosquito, Man-of-war, and Sea Wolf Keys, the last being to the eastward of the Man-of-war Keys. The northernmost of the Man-of-war Keys lies about 20 miles distant from the Great River. Between all these keys there are good channels, with from 5½ to 9 fathoms water, on clean mud; but to take them it is necessary to have a pilot, and if you have not one, you ought to go outside the whole of them. To enter the anchorage of Great River, you should pass between the Man-of-war Keys and the coast; in which channel, until you arrive at Great River, there is nothing to fear or attend to but the lead.

PRINCE AMILCA RIVER.—To the N. by W. from Great River, at the distance of 11 miles, there is another river, called Prince Amilca,* from which, in the same direction, and at the distance of 9 miles, is the Black Rock River. From this the coast trends north, a little easterly, for 11 miles, to the River Tongula; in front of the mouth of which, about 5 miles to the eastward, there are some rocky shoals, which are the only dangers along the coast, between this river and Great River.

THE COAST TO BRACMA POINT.—From the River Tongula the coast trends about N. by W., for the distance of 17 miles, to the River Warva; whence it continues to the north for 9 miles, to Bracma River; and thence it rounds to the N. E., a distance of 8 miles, to Bracma Point. This last part of the coast, called the Barrancas, or Bragman's Bluff, forms a bay sheltered from the norths, and westerly winds, and in it you may anchor, in any depth that suits you, understanding that at two miles from the land there are 4 fathoms, upon coarse gray sand and small shells. Great care should be taken in landing on this beach, as there is a bank before it, on which, with ever so little wind from the east, the sea breaks with great force.

THE COAST TO GRACIAS A DIOS.—From Bracma Point the coast trends about N. N. W., a distance of 6 miles, to the River Tupapi, or Housetana, which is known by a town situated about three-quarters of a league from the beach, and discernible at a good offing, as the ground is level and bare. From Tupapi the shore runs about N. N. E., a distance of 20 miles, to the Governor's Point, which is known by being more salient eastward than any other on this coast, and thickly covered with trees. From this point the coast trends to the N. N. W., a distance of 12 miles, to the mouth of Arenas, or Sandy Bay, in which there is so little water, that, in the time of the breezes, launches pass with difficulty; but within, there is a deep and spacious bay.

* There is a great variety in the charts in the names of this and other rivers on the coast, and also of the keys.

From Sandy Bay the coast trends to the north 10 miles, to the River Guanason, and thence to the Bay of Gracias a Dios, it is 13 miles in the same direction.

THE BAY OF GRACIAS A DIOS is formed by a tongue of land extending to the eastward more than 4 miles, and which affords a good roadstead, with winds from S. S. W., round by W. and N., to S. S. E. The easternmost and southernmost point of this tongue of land is that which is called Cape Gracias a Dios; and from it to the south there are several keys, of which the last or southernmost is called San Pio; and the south point of it, called Arenas Point, is also the east point of the bay. The depth of water in the bay is from 20 feet, which is found at the entrance, to 16, which is found well within it; and in all parts of it the bottom is soft, slimy clay.

INSTRUCTIONS FOR TAKING THE ANCHORAGE OF GRACIAS A DIOS.—To anchor in this bay, if approaching it from the north and west, you have only to pass the sandy point of Key San Pio, and then run into the bay, and anchor in the number of feet suitable to the vessel's draft of water, for all of which you have only to attend to the lead. The only thing which demands a little care, is not to mistake for the Key San Pio, that which comes before it, called Troncoso; for having a strait of a mile in breadth between them, and the Key San Pio being very low, any one coming from sea may be deceived, and take the strait between the keys for the entrance: but this mistake may be avoided, if you bear in mind that Key Troncoso is very small, and, on the contrary, that Key San Pio is a mile in extent from N. E. to S. W.; and farther, in this strait, there is so little water, that scarcely a canoe can pass, which is the cause of the sea generally breaking in it. To those coming from the southward, in order to enter this bay, we have nothing farther to recommend.

Such is the description of this bay, given in 1788, by Don Gonzalo Vallejo, who anchored in it in the corvette San Pio, under his command; but we ought also to add what Don Josef del Rio reports of it, after visiting it in 1793. "I ought to make known that the anchorage in the Bay of Cape Gracias a Dios is becoming lost; for the cut of communication made by the English from the Great River Segovia, across the tongue of land that forms the bay, for the purpose of conveying into it the timber which they bring down by that river, has increased so much in width that, from a narrow canal, it has become a branch of the river, and brings with it so much soil, and so many trunks of trees, which has diminished the depth of the bay so much, that since the year 1787, there are three feet less water in the vicinity of Key San Pio; and it is very probable, that, within a few years, the depth will be filled up, and vessels will be obliged to remain on the outside, deprived of the shelter they at present have, and which is of so great an advantage to those who navigate on this coast during the season of the norths."

All the coast from the River Tongula is clean, without any other keys or reefs on the bank than those already described; and those which are between the parallels of Governor's Point and Cape Gracias a Dios, which are named the Mosquitos and Thomas' Keys. These keys, with their reefs, form, with the coast, a channel four leagues in breadth where narrowest; and although between them there are passes with a depth of 6 fathoms or more water, yet it is not advisable to attempt them, but always run to the westward, between them and the coast; for there can be no risk in this channel, as the lead will give timely warning, either in sailing with the wind large, or working to windward; for at half a league from the coast there are 4½ fathoms, and 9 in the vicinity of the keys; therefore, by not getting into less than 4½ when standing westward, or into more than 8 fathoms to the eastward, there will not be the least risk or cause of anxiety.

From the Bay of Gracias a Dios, you may steer S. S. E., which course will take you in sight of the westernmost key of this group, which is a dark brown rock, that may be seen at the distance of 5 or 6 miles. On this route you will have from 7 to 8½ fathoms, and the course must be kept without going anything to the eastward of it, until you are well clear of the southernmost keys: the surest indication for which, will be your getting the depth of 11 fathoms, and thence you may shape a course for your voyage.

FROM CAPE GRACIAS A DIOS, WESTWARD.—From Cape Gracias a Dios the coast runs about N. W. for the distance of ten leagues, to Cape False, which may be known from being the highest land on this part of the coast. From the False Cape, a bank, with very little water on it, projects out to the N.E. to the distance of 6 miles: but the coast bank preserves its regular soundings, and it even seems as if they extended to the Serranilla; but however that may be, it it so little known, that 9 fathoms is the greatest depth that you ought to navigate in, because there are various shoals, of which the positions are very doubtful; and, therefore, to navigate with safety, you ought not to get into deeper water than 9 fathoms, nor into a less depth than 5½ fathoms; and this rule will hold good, either in steering a direct course, or working to windward; for you will thus be sure of navigating in a clean channel of 20 miles breadth.

From False Cape the coast trends about W. N. W. for a distance of about 35 miles, to the Lagoon of Cartago, or Caratasca, which is easily known by its wide mouth. All this coast, like the preceding, is clean, with regular soundings along it; and, to navigate on it, the lead is a sufficient guide, so that you may not get into less than 5½ fathoms when

standing towards the shore, or into more than 9 when standing off; by doing which, you will evade falling on the Vivorilla,* &c., as they lie about 8 leagues off the coast northward.

From Cartago Lagoon the coast trends about W. N. W. for a distance of about 20 leagues, to Brewer's Lagoon; and thence, almost on the same bearing, a distance of 8½ leagues, to the Rio Tinto, or Black River.

BLACK RIVER, AND METHOD OF ANCHORING OFF IT.—Black River is distinguished by the mountains of La Cruz, which are very lofty, and are the first to be seen on all the coast, after passing Nicaragua. These mountains are a little to the eastward of the river's mouth; on the same river there is a peak, named the Sugar-loaf, because it is of that shape. To anchor off this river, bring the mouth of it to bear south, and Cape Cameron west, taking care not to get into less than 11 fathoms; because in less depth there are many lost anchors, left by ships obliged precipitately to make sail when the norths have set in.

This anchorage is an open roadstead, where, even with the winds of the breeze, it is necessary to ride with two-thirds of a cable out; and so soon as the wind falls, to heave in to nearly a-peak, in order to avoid fouling the anchor. When lying in this anchorage during the season of the gales, which, as we have said, is from October to February, the utmost attention must be paid to the state of the weather: and when you see the wind gets to the south-east, and then veers to south and south-west, you ought immediately to weigh the anchor, and make sail off shore, well clear of the land, for a gale will surely succeed. Cloudiness, or a foul appearance in the N. W. quarter during these months, is an almost infallible sign of an approaching gale; a swell from the north is an indication equally certain, that precedes the gale at a moderate interval. In any of these gales, the loss of a ship remaining at anchor is inevitable; frequently the wind will not give time to weigh the anchor; in which case the cable must be slipped, with a buoy upon it, or even cut, that you may immediately make sail, and get clear from the land, in order to encounter the gale under sail. These gales are very violent, and raise a heavy sea, and therefore, if a ship is very much distressed, she has the resource of running to the Bay of Gracios a Dios for shelter, and riding out the gale at anchor; and it has been already observed, that the lead is a guide which there will carry you clear of all danger. As these gales occur more frequently from the N. W. and W., than from the north, the result is, that ordinarily, the anchorages of Gracias a Dios may be considered as a port to leeward, to which you can bear away; in which resource there will be found the advantage of being to windward of the Black River, when the hard weather ceases; because then the breeze blows from the east, and therefore, in a short time, and almost without trouble, you can return to your former anchorage.

BLACK RIVER BAR.—The Bar of Black River is extremely dangerous, and boats run great risk of being upset on it, and the crews on board of them of perishing, from the very heavy sea there is generally upon it. Therefore, either to enter or come out of it, it is necessary that it should be done in the calm of the morning, before the sea breeze sets in, and after the land breeze has blown the preceding night. If the breeze has been tolerably fresh, neither going in nor coming out can be effected; so that communication from the shore is far from frequent, and is always very troublesome and dangerous.

COAST TO CAPE CAMERON AND PUNTA CASTILLA.—From Black River the coast trends west, with some inclination to the north, for a distance of 9 miles, to Cape Cameron, which is formed by a low tongue of land projecting into the sea. From this Cape the coast trends W. 3° S., a distance of 20 leagues, to Punta Castilla, or Cape Honduras: it is all clean, and also deeper than the anterior coast, so that it should not be approached into less than 7½ fathoms water.

Punta Castilla is low; and a small sand bank, with very little water on it, extends from it one quarter of a mile to the westward. Castilla is the north point of the Bay of Truxillo; which at the entrance is about 7 miles wide. This bay is easily entered, as there is nothing to be guarded against except the little bank off Point Castilla. On the south coast of the bay there is a high mountain, called Guaimoreto, which may be seen at the distance of 24 leagues. In making the bay from the offing, this mountain is a good mark for running in by; for, by bringing it to bear about S. E., or S. E. by S., it will lead clear of Point Castilla, and up to the anchorage off the mouth of the River Cristales, which falls into the south side of the bay. This anchorage seems preferable, not only because its contiguity to the river affords the opportunity of procuring water conveniently, but also, because from this spot Point Castilla may be easily cleared, in case of being obliged to get under way by a gale from W. S. W., west, or W. N. W.; whence it blows most frequently from October or November until February. With such winds, a simple inspection of the plan of the bay will show that there must be a heavy sea in it;

* There are many charts in which this and other rocks do not appear; but we do not think proper to alter these directions until we have a more correct account of the situation of all of them.

and this was experienced in the ship Maria, in December and January, 1800, which having rode out one or two of these gales at anchor, was afterwards under the necessity of quitting and taking shelter in Port Royal, in the Island of Rattan, as her captain considered the anchorage of Truxillo too hazardous to remain at during the season of the norths, which was the season he was in it.

To enter in or sail out of this bay, no particular instructions are necessary, as there is plenty of room for working, without the smallest risk, observing only not to approach Blanquilla or St. Lucas Key nearer than half a mile: this key is off the south coast, about two miles outside the bay, and is surrounded by a bank, with little water on it, the best guide towards which is the lead. Take care not to get into less than 5½ fathoms in its vicinity, and you will avoid every danger. Blanquilla lies about a mile from the coast, and you may run through the channel between, without any other guide than the lead. It was heretofore believed that this bay was well sheltered, and a good place of refuge during the storms of winter; but this is not the fact, and any vessel stationed on the coast at that season. ought to prefer Port Royal, in Rattan, to it.

GUANAJA, or BONACCA.—North from Point Castilla, at the distance of eight leagues, is the Island of Guanaja, about three leagues in length, N. E. and S. W. It is entirely surrounded by keys and reefs, which extend a league off from it. On the east side of the island there is a very good anchorage, particularly during the north winds; but it will be necessary to pass between the keys and reefs to enter it. The best passage is to the southward, leaving the southernmost key on the larboard, and another key, lying N. by E., half a mile from it, on the starboard. Endeavor to pass in mid-channel, and steer towards another key that lies two-thirds of a mile west from the northernmost of those you have passed. It will bear from you about N. 71° W. You ought always to pass between the two last mentioned keys, and then nothing remains but to coast along the island to the N. E., and anchor at any convenient place, after getting under shelter of the land; observing to keep about the middle of the channel, between the island and the keys, in 7, 8, and 9 fathoms water, on muddy sand. It may be necessary sometimes to run for this anchorage in blowing weather from N., N. W., or W., which will not permit of entering it on one stretch. In such a case, however, it may be observed that you may work between the three keys before mentioned, on the supposition that it will be sufficient to give them a berth of a cable's length. The plan of the harbor will clearly elucidate what has been said of it.

RATTAN.—Westward of Guanaja is the Island Rattan, about 10 leagues in length, from E. N. E. to W. S. W. A reef runs off eastward from the east point, to the distance of 12 miles, on which there are several keys and islands; of these, the easternmost is called Barburet. The distance from Barburet to Guanaja, is about 10 miles; but the channel is reduced to 5 miles only, by the reefs which extend from both islands: without great experience, the passage through it will be attended with great danger. All the North Coast of Rattan is bordered by reefs, that prevent its being safely approached nearer than a league; and those not well acquainted with the coast, should keep at a still greater distance. On the South Coast there are several good roadsteads, but most of them are difficult of access from the foul reefs at the entrances. Of all these harbors, that called Port Royal, on the eastern part of the island, is the principal; and of which mention was made when describing the Bay of Truxillo, as being well adapted for affording shelter during the season of the norths. It is formed by the coasts of the island on the north and west, and by some reefs and keys on the south and east: the entrance to it is by a narrow channel, scarcely half a cable's length wide, between the reefs; but fortunately, this narrowness is not more than a cable and a half's length. The east side of this channel is formed by a reef extending from the west side of the island called Lein, which is easily distinguishable from its size, and cannot be mistaken for the other keys, which are very small. In attempting to enter this harbor without a pilot, it will be necessary to *mark the entrance* by boats or otherwise; and it ought always to be done with the wind from N. E., easterly, or from west, southerly, in order to get clear within the reef: we refer to the Plan of the Harbor, but it must be mentioned, we cannot guarantee the correctness of it. In approaching the island from the southward, great caution is required, to avoid a *rocky shoal* nearly opposite the western extremity of it, at the distance of more than 4 miles from the coast: the channel between it and the coast is also obstructed by several *other shoals*; and although there is a passage for large ships, yet without an experienced pilot, they should always pass on the outside of it.

FROM TRUXILLO, WESTWARD.—From the River Cristales, in the Bay of Truxillo, the coast trends about S. 75° W., a distance of 32 leagues, to Triunfo de la Cruz, or Triumph of the Cross. This coast is *dangerous*, on account of several *reefs* and *shoals* which extend from the south side of Utila; for which reason, if there is no cause for keeping near the shore, or you have not the requisite experience for making the passage without risk, we strongly recommend a course always to the northward of both the Cochinos and the Island Utila.

THE COCHINOS are two rather large islands, clean on the north side, but with various foul keys and reefs on the south: between these islands and the keys there is a regular anchorage, respecting which the only information we possess is a plan, that, on examination, will present all the instructions requisite.

UTILA ISLAND lies about N. 75° W. from the Cochinos, at the distance of 23 miles: the north, south, and west coasts of it are *foul*, but the East Coast has a good anchorage; to enter which safely, much experience is requisite. To the S. W. of this island, lies a shoal, called the Salmedina, of more than 5 miles extent; on account of which, when going to the northward of Utila, observe to approach it no nearer than two leagues, until you are abreast of its western points; you may then run down for the coast about Punta Sal: in doing which, a S. W. by W. ½ W. course will counteract the effect of the current, that hereabout sets N. W., and might otherwise drift the ship into some difficulty with Long Reef.

THE TRIUNFO DE LA CRUZ is a point whence the coast rounds to S. S. W. and S., about 7 miles, and then bends to the N. W. for a space of 22 miles further, to Punta Sal, forming a great bay, sheltered from the breezes, and with good anchorage for ships of every denomination. To the north of Cape Triunfo, at the distance of half a mile, there are some islets, two of which are tolerably large, and may be seen at the distance of two leagues; they are clean, and by passing at half a mile from all that is visible, you may proceed direct to the anchorage in the eastern part of the bay, a little to the southward of the point, in 5½ to 8 fathoms water, on sand.

PUNTA SAL.—The point at which the bay terminates is called Punta Sal, or Salt Point: and at about half a mile to the northward of it lie some high rocks, called the Bishops, forming a channel navigable for boats only. The Point appears with some hillocks and broken ground, and to the southward of it there is a little harbor, called Puerto Sal, but of which we have no details: however, off the mouth of this harbor, and at the round of Punta de Sal, you may anchor, under shelter from the breezes; but it will be necessary not to come to in more than 12 fathoms, because in 17, 16, 15, and 14, the bottom is rocky: while, on the contrary, in less than 12, it is clean clay.

From Puerto Sal the coast lies about W. S. W., a distance of 8 miles, to the River Lua, which is large and deep: in front of this river there is *anchorage* on excellent holding ground, of clay, but without the least shelter from the norths.

About 8 miles, W. ¼ S., from the River Lua, is that of Chamalacon, off which there is also anchorage on good holding ground, but also unsheltered from the norths.

PORT CABALLOS, or CAVALLOS, lies about W. S. W. from the River Chamalacon, and at the distance of 4 leagues. This harbor is formed by a low point of sand to seaward, on the west side of which there is an anchorage in 5½ to 4½ fathoms, on sand. The harbor may be known by a high round hill, which is situated close to the sea, on the eastern coast, and at about two leagues to the eastward of the port. To enter this port, you have only to keep clear of what is visible.

From Porto Caballos to Omoa, the distance is 7 miles, S. W. by W. Within this space there is a small bank, with little water on it, lying north of some red gullies or broken ground, which are seen on the coast, and at the distance of about a league and a half from them. To keep clear of this bank, take care not to get into less than eight fathoms, until you have passed the red gullies; you may then steer direct for Omoa.

OMOA.—The Harbor of Omoa is formed by a low point of land, covered with mangroves, which projects out to sea. Upon this point there is a signal tower, or lookout, which is well seen from sea, and serves as a mark to recognize the harbor by. It may also be known by the high land rising from Omoa, and running westward, because from Omoa eastward it is all low. To enter into Omoa, we have nothing to say, only that you may pass at a cable's length from the mangrove point, which forms the harbor; and on getting to the westward of it, you ought to luff as much as possible to the south and east, to fetch the south part of the point, with the object of trying whether you can enter into the basin, or caldera, under sail; but, as it will be necessary to steer north for this purpose, the best way will be to get as much to the eastward as possible, until you are abreast of the mouth of the basin, and anchor there for warping in.

From the anchorage of Omoa, in clear weather, Cape Three Points may be seen, bearing about W. by N. ½ N. All the land to the westward of Omoa is very high, and upon it rise 3 or 4 summits, resembling sugar-loaves; but the coast is very low, and continues so to the Gulf of Honduras. From Omoa to Cape Three Points, the distance is about 11 leagues, the intermediate coast trending a little to the southward, so that it forms a bight, in which there is generally a confused sea; and therefore, it is advisable not to go too near to it, but rather to steer W. N. W., or N. W. by W., to pass well clear of Cape Three Points. After running a short distance on these courses, you will see at the N. W. the southernmost keys, which lie off the coast of Bacalar, and which are about 5 leagues distant from Cape Three Points. In all the channel leading into the Gulf of Honduras, and as far as Point Manabique, the greatest depth of water

is 23 fathoms. Point Manabique is about 3 leagues W. by N. from Cape Three Points; and west from it, at the distance of a league and a half, there is a bank, with little water over it, called the Buey, or Ox, to which a berth must be given.

GULF OF HONDURAS.—Point Manabique and the Southernmost Keys of the coast of Bacalar form the entrance of the Gulf of Honduras, within which, and at S., or S. by E. from Manabique Point, is the Bay of St. Thomas de Castilla, or St. Thomas, of Castile; and S. W. by S., or S. W. from the same point, lies the mouth of Rio Dulce. All this gulf is shoal, but with depth sufficient for ships of every class; but in navigating in it, you ought to keep the lead going, and have the anchors ready to let go, if necessary, or if you wish to anchor. The mouth of the River Dulce may be known by a little insulated hill which is somewhat to the westward of it. The anchorage is N. N. E. from the mouth of the river, in any convenient depth of water, and the anchors must lie N. W. and S. E.

From the River Dulce the coast rounds to the N. and E., to Point Tapet, which is about 18 miles N. W. from Manabique; and thence north-easterly to Cape Catoche, which, with Cape San Antonio, in the Island of Cuba, forms the south channel into the Gulf of Mexico. On this coast there is a reef extending to the 19th degree of latitude, on which there rise almost innumerable keys, with various openings or passages through them, by which the coast may be approached. The southernmost keys on this reef are the Zapadillos, which are about 5 leagues distant from the coast. Between this reef and the coast there is a channel, with a good depth of water in it, but it is full of dangers; and speaking generally, it may be said that all this part of the coast is so foul, and so little known, that it cannot be navigated near without great risk. There are not only the reef and chain of keys already mentioned, but other foul reefs also; namely, Long, or Glover's Reef, Four Keys Reef, and Chinchorro. Some of these lie more than 20 leagues from the coast, and with it form channels free and navigable.

The Mosquito Coast, from Black River to Point Bracma, by Captain George Counless, when commanding H. M. sloop Porcupine, 1786 *and* 1787.

[The Courses and Bearings are magnetic.]

Black River is known by the land over it, which is the easternmost high land on the Mosquito shore, and very remarkable, called Poyer Hills; to the westward it is all high land. Therefore, if when steering in for Black River, you fall in with high land to the eastward of you, you will be certain of being to the westward of it. It is quite an open road, the shore lying nearly east and west: you must, therefore, lie at a single anchor, and be ready to put to sea the instant the north comes on, even if you are obliged to leave your anchor; as the swell sets in so violently, there would be little chance of riding it out, and in case of parting, in all probability you will be driven on shore.

The number of anchors left here makes the road very bad, as your cables are liable to be cut by them, or in heaving up, to hook one; in which case you seldom fail losing your own, as it is good holding ground; this was the case with us on the 27th of November, 1786. For the above reason, it is advisable to lie somewhat to the eastward of the usual anchoring place, where you will have clear ground. Should the wind come to the westward of north, you must run to Cape Gracias a Dios; but if it should be to the eastward, you may go either to Truxillo or Bonacca. The north prevails from October to February.

We anchored in 12 fathoms, directly off the river, with the Sugar-loaf of Poyer Hills bearing south, and Cape Cameron west; but, with the Sugar-loaf bearing S. ½ W., there is less risk of getting foul of anchors. When the trees on the low land are seen from the deck, you will have 80 or 90 fathoms, from which it shoals regularly to 9 fathoms, on muddy bottom. The entrance into the river is narrow, and distinguishable from the other land; it has a dangerous *bar* across it, which can very seldom be passed, except in the morning, before the sea breeze sets in; and then only in *their* craft: though it is sometimes smooth enough for a ship's boat to go over in safety. Being over the bar, and in the entrance of the river, you must proceed up a lagoon on the right hand, about 1½ mile to the town, or bank, as they call it, which is the principal settlement, and is very pleasantly situated on the left side of the lagoon, going up. The town is about a mile long, and consists of only one street; at the east end of it there is a battery of 12 guns en barbette.

Good water may be obtained a little way up the river, and plenty of wood; but both must be got off in the country craft, on account of the bar.

From the Black River to Cape Gracias a Dios, we kept along shore, sounding in from 7 to 10 fathoms. Off Patook River, which lies at a considerable distance to the eastward of Black River, we observed the fresh water, where it joined the sea, form a distinct line as far as we could see, being very brown and muddy, and had the appearance of a shoal. When in it, we found the water nearly fresh; at the time of this alarming appearance there was a flood in the river.

Off the Caratasca Lagoon it is shoal to some distance; we passed it in 6 fathoms, keeping off and on, as we shoaled or deepened the water. On passing the False Cape, be careful to give it a good berth, keeping in 5 fathoms, as a dangerous shoal runs off from it; then keep along shore in 5 fathoms for the cape, which appears like a bluff point, with level low land to the westward of it. As you proceed to the southward, keeping in 4½ or 5 fathoms, you will see near the cape three small islands, with moderately high trees on them; but they all join the land by a narrow beach: beyond them is a low sandy key, connected with the other by a reef, and forming the entrance of the harbor, it appears to lie across the mouth of it. As a spit runs from this key, you must give the point a berth of about 2 cables' length. There is good anchorage within the spit point in 4 fathoms, the said point bearing S. E., distant three-quarters of a mile, where the Porcupine anchored, having little wind, and there being a great outset occasioned by a fresh in the river. You may bring the southernmost point of the Spit Key to bear S., and the northernmost point S. E. by E., distant three-quarters of a mile, and anchor in 4 fathoms.

In working up the harbor the soundings are regular, from 4 to 3 fathoms muddy bottom. The town, which is only a few huts built for the convenience of the wood-cutters squaring and shipping off their mahogany, is situated on both sides of the Haulover, which is a cut they have made from the River Wanks across into the harbor, the river running into the sea by the cape. Through this cut, great trees and logs have been drove, which have lodged round it, and formed a bar about two cables' length off, over which there is barely water for a boat; and it is increasing, so that it is very probable it will in time spoil the harbor. Before this cut was made, there was deep water close in, and they brought their wood through another opening to the eastward into the harbor. There being a flood in the river, and consequently a continual outset, could make no observations respecting the tide. Latitude observed, 14° 59′ N.

SANDY BAY is the residence of one of the Mosquito Chiefs, and lies about 9 leagues from Cape Gracias a Dios, to the southward; it is low level land, and only to be distinguished by a gap among the bushes near the beach, which the Indians have cut through for nearly a mile, to open a passage into a spacious lagoon for their craft, directly across which is their town, very near the water side, in the midst of a plantain walk, on which, and some cassada roots, with turtle that they catch in the season, is their chief dependence for support. The coast here trends nearly north and south; the Porcupine lay in 6 fathoms, about two miles from the shore, with the creek bearing S. S. W. ½ W., at the distance of 3 miles; here we were obliged to ride out a gale of wind, with a heavy sea setting right on the shore. The bar, which is off the creek, is not above a cable's length from the shore, and has a continual breach over it, without any very heavy surf; I went over it in one of *their* craft, which the Indians are very expert in managing. Neither wood nor water can be procured, except from the Indians, and brought off in their craft, for the ship's boats cannot go over the bar. Latitude observed, 14° 30′.

It is better to anchor farther southward off the creek, bringing it to bear W. by S., or W. S. W., for the convenience of getting off from the shore. The water rises and falls here a little, but there is no regular tide.

TREBUPPY is about 7 leagues to the southward of Sandy Bay, and is the residence of the Indian Chief Governor, who is considered to be the most powerful chief on the Mosquito shore. On running down you will see houses a considerable way inland, which is the Governor's Town, off which we anchored. The land is not high, but has the appearance, from the ship, of being cultivated. The Porcupine lay in 5 fathoms, between 2 and 3 miles from the shore, and 3 from the bar, and found three fathoms very near in. The bar is at the entrance of a small river, that runs winding up to the town, and is only safe to be passed in the country craft. It is no better lying here than at Sandy Bay, as it is a straight shore. The bearings at the anchorage were Brangman's Bluff, (Point Bracma,) S. W. ¼ W., the river's mouth W., and the northernmost land N. by E. Latitude observed, 14° 8′ N. Found a current setting to the southward.

Neither wood nor water to be had here, except procured from the Indians, and brought off in their craft.

BRANGMAN'S BLUFF (Point Bracma) makes off in a point from where we lay off Trebuppy, about the distance of 5 miles, and has somewhat of a bay to the southward of it. We ran in till the bluff bore N. N. E. ½ E., and anchored in 4¼ fathoms, about 2 miles from the shore, with the river's mouth bearing N. W., and the southernmost land S. W. by S. At about half a mile within the ship there were only 3 fathoms. The appearance of the land is much the same as at Trebuppy: there is a bar at the river's mouth; and at about 2 miles up the river are the few houses of the inhabitants, who have a number of cattle and good pasturage, some of which we procured. There are no Indians living here. There is a considerable rise and fall of the tide in the river, but at the anchorage we could only perceive a small southerly current. Latitude observed, 14° 9′ N., variation 8° 50′ E.

Wood and water may be got here, but they must be brought off by the inhabitants in their craft.

DESCRIPTION *of the Swan Islands, &c., with Directions for Navigating from Half Moon Key to Balize ; and from English Key Northward past Mauger Key, Turneff: by Capt. G. Sydney Smith, while commander of H. M. sloop Bustard*, 1827–1828.

The Swan Islands, two in number, are low, but may be distinguished from the masthead in clear weather at a distance of 5 leagues. They are in extent about 4½ miles, in an E. N. E. and W. S. W. bearing, and have a passage between them, in which there is only sufficient water for a boat: they may be approached on either side with safety to a distance of three-quarters of a mile; and at the S. W. end of the western island there is a fine sandy bay, and clean bottom, where a ship may anchor in safety in from 7 to 10 fathoms, at half a mile off shore. Farther west, at from 1½ to 2 miles distant, the bottom becomes foul, with very irregular soundings, from 10 to 4½ fathoms. A bank of this description has been said to exist off the east end, where the Bustard obtained soundings in 12 fathoms, on rocky bottom, at a mile distant from the point, whence the depth decreased gradually to 5 fathoms, at half a cable's length from the shore, the boats being dispatched to sound round both islands. The easternmost island is infested with innumerable boobies, its shores not accessible without great danger, or injury to the boat. The western island, on the contrary, is well wooded, with several good landing places in small sandy bays, which abound in turtle ; some hundreds of their eggs were collected on the beach in the space of a few minutes ; and several large snakes were killed by the boats' crews, found feeding on the eggs. Cocoanuts were in great numbers on the north side. Search was made for water, but without success, though it might probably have been found by digging.

Observed latitude of the West Island, 17° 24′ N., longitude, by chronometer, 83° 53′ W.

MISTERIOSA BANK.—North, 90 miles distant from the Swan Islands, is the Misteriosa Bank; this bank has been partially examined by Capt. R. Owen, of H. M. ship Blossom, and is inserted on the chart published by E. & G. W. Blunt.

Mr. Allen, formerly first lieutenant of the ship, says, in a note to the author of this work, we have not entirely completed the examination of this bank, but believe there is a small key on the north end of it.

THE MISTERIOSA BANK was met with by D. Tomas Nicolas de Villa, in his passage from Truxillo to Batavano, in April, 1787, having sounded in 11 fathoms, on white sand and stones. The latitude deduced from that observation at noon, places this bank in 18° 48′ 42″ N. Its longitude is 77° 29′ 24″ W. from Cadiz, as deduced from Punta Castilla, at Truxillo, (well ascertained by Gen. Don Tomas Ugarte,) allowing for the errors which Villa might have made in five days' navigation. Also, on the 11th of April, 1805, D. Josef Maria Merlin, captain of a particular frigate, called the Flecha, sounded on this bank in his passage from Cadiz to Vera Cruz. According to his observations, the depths of 9 and 13 fathoms were in north latitude 18° 52′ 42″, and 18° 53′ 36″. His longitude was deduced from the spot where he had 16 fathoms, on the eastern edge of the Seranilla (well ascertained by B. D. J. F. Fidalgo ;) and it seems, after making all the corrections for the action of the currents, &c., the longitude of Misteriosa by Merlin is 77° 39′ 30″, which, differing only 10′ from the former, shows that the bank is well fixed, and not very far from its true situation, taking the mean of the two longitudes, 77° 34′ 37″ west of Cadiz, (83° 51′ 37″ west of Greenwich,) will be that in which we place it.

THE ALBION AND MAUD'S BANK, described in a former edition of this work, are without doubt the Misteriosa Bank.

GLOVER'S REEF.—This is laid down from the surveys of Com. R. Owen, of his Majesty's ship Blossom, and published by E. & G. W. Blunt, 1833. The bank is in general very dangerous. With the common trade wind the current sets strongly over it to the westward. The following description has been communicated by Capt. J. Burnett :

"Glover's Reef, which has two sand spots on the north end, lies nearly south from Hat Key, distant 15 miles, trending thence S. S. W. ½ W. to the south end of the reef, on which there are five islands or keys. These may easily be known from the southern four keys, as they are quite bold on the south side. The keys are very little detached, and nearly all of the same height, with numerous cocoanut trees on them. If, from want of observation, and strong current, you may have gotten to the southward of Glover's Reef, and the wind be so far to the northward that you cannot sail north for Key Bokel, night coming on, you should anchor to leeward of the key, where there is good ground, in from 7 to 17 fathoms, within half a mile of the keys, and there either wait for a wind, or till you send into English Key for a pilot."

BALIZE, or BELIZE.—Pilots for Balize are always in readiness at Half-Moon Key, (the S. E. key,) on the east end of which stands the light-house, whose lantern is

elevated about 50 feet above the sea, which may be seen in clear weather when 4 leagues distant—a circumstance that causes this route to Balize to be generally preferred—though in the season of the north winds, that is, from October to March, it is considered by some, and with apparent justice, best to make Mauger Key, the northern key on the Turneff, from which you may run with a fair wind S. S. W., 6 leagues, to English Key: whereas, by approaching Half-Moon Key at this season, the prevailing winds will not allow you to fetch Key Bokel from Hat Key Reef, and also gives you a dead beat to English Key. It has been recommended by some to make Bonacca, in lat. 16° 35′ N.: but this island is surrounded by reefs, which circumstance, combined with the strong southerly currents at the season alluded to, when gales from the N. and N. W. may be frequently expected, renders it a coast rather to be avoided, particularly as the only port under your lee would be New Port Royal, in the south side of Rattan—a most desirable port for persons acquainted—but the entrance lies between reefs, and is intricate, and pilots are seldom to be obtained.

Observed latitude of the light-house on Half-Moon Key, 17° 12′ 30″; longitude, by chronometer, 87° 27′ 10″ W.

HAT KEY AND REEF.—W. S. W. of Half-Moon Key lies Hat Key, which is wooded, and resembles, in form, a coronet. A dangerous reef extends from this key S. by E. 3 miles, to clear which, when 2 miles south of Half-Moon Key, they steer S. S. W. ¾ W., 10 miles. From the edge of the reef to Key Bokel, the course is W., or W. ¼ N., according to the wind, 7 leagues.

KEY BOKEL AND ANCHORAGE.—Key Bokel may be known by its fine sandy beach and three or four cocoanut trees, and may be rounded at half a mile distant, but not nearer. Should you wish to anchor, a clear sandy bottom will be found, with from 10 to 4 fathoms, the centre of the key bearing from E. by S. to S. E.: the E. S. E. bearing is preferred. It is advisable to give a good scope of cable at once, as, from the edge of the bank being very steep, you are liable, in case of squalls or fresh breezes from the eastward, to drive off it before you could have time to veer.

ENGLISH KEY.—The course and distance from hence to English Key is N. W. by N., 4 leagues. It has three cocoanut trees on its centre, is sandy on the N. E. side, and bushy to the water's edge on its S. and S. W. sides, lying at the south side of the entrance to the channel to Balize.* Goff's Key is situated on the north side of the channel, is very small and bushy, with one cocoanut tree in the centre, and surrounded by a sandy beach. To the eastward about half a mile is a sand patch, called by the pilots "Sand Bore," nearly even with the water's edge, and requires a good berth in rounding. The anchorage is in from 8 to 4 fathoms, with Goff's Key bearing from N. by W. to N. by E., or the keys to the northward of Goff's Key in one. From this place, unless perfectly acquainted, you cannot proceed without a pilot.

There is also anchorage in 4 fathoms at "Joe's Hole," under Turneff, as far north from Key Bokel as to have English Key bearing N. W. by W. The depth of water between English and Goff's Keys is 20 fathoms. Pilots are generally found on the former of those keys, waiting the arrival of vessels coming in from the northward.

The course in mid-channel from English Key to Balize is about W. N. W. till the west end of Water Key bears north; then haul up to N. by W., or N. N. W., till Goff' Key is on with Water Key, which is the mark to run over the narrows in 2¼ fathoms; then N. W. and N. W. by W., hauling to the northward after passing the middle ground, which has only 10 feet water on it, and lies from 2 to 2½ miles from Balize. From the Narrows you will find 7 fathoms, decreasing gradually as you approach the anchorage. The marks for anchoring off Balize are the steeple of the church on with the centre of Government House, and the south end of Fort George, situated on a low flat island, bearing N. W. ½ W., where you will have 2½ fathoms, on muddy bottom. Ships of a greater draft of water lie at a considerable distance from the town, and proceed to it through a wider and deeper channel than the one described, having in it 3 fathoms and upwards.

The current in the anchorage sets to the southward, at the rate of one mile per hour, with a rise and fall of 2 feet.

Supplies of all sorts are of a very inferior description. Vegetables are seldom to be procured, and never but in very small quantities. Beef is also inferior, and very scarce. Turtle alone is abundant. The water is not good for a voyage, unless taken from about 14 miles up the river, except during the rainy season, when it may be had perfectly fresh, 2 miles from its mouth.

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* Copy of a notice, dated Lloyd's, 10th May, 1823.—"Many vessels, at different times, having been lost on the main reef, when going into Honduras, from being unable to distinguish English and Goff's Keys (between which is the only ship channel into Balize) from the many other keys on the main reef, Major General Codd, his Majesty's Superintendant, has caused a flag-staff, 60 feet high, with an octagon figure on the top, to be erected on English Key.

(Signed) "JOHN YOUNG, Agent for Honduras."

MAUGER KEY.—The course from English Key to Mauger Key is N. E. by N., 6 or 7 leagues. It lies in latitude 17° 36′ 15″ N., and longitude 87° 42′ 30″ W., being the northernmost key on Turneff, with a reef extending from it N. N W., 2 miles. To the S. S. W. is Crawl Key, at the S. W. end of which there is anchorage during the regular trade winds, in 4 or 5 fathoms. To the eastward of Crawl Key lies Three-cornered Key, all having a great resemblance to each other, Mauger Key being the smallest, and, as before stated, the northernmost.

From Port Royal, Jamaica, to the Bay of Honduras, and thence to the Island of Cozumel; by Capt. Wm. Sandom, R. N., in the years 1826 *and* 1828.

[The Courses and Bearings are magnetic.]

SWAN ISLANDS.—Left Port Royal for Balize, Honduras, on the 24th of June, 1826. Having some doubts as to the true situation of the Swan Islands, as they are laid down directly in the track from Jamaica to Balize, I determined on making them, which was done at 8h. 30m. A. M. of the 26th. After making the east end, I ran down the north side, which is bold, and may be approached with safety to the distance of half a mile, until within three-quarters of a mile of the west end, where shoal water and dangerous rocks lie off full one mile and a half. The easternmost of these islands is not low, and may be seen in clear weather 18 or 20 miles off. I observed from the masthead, in coasting along the north side of these islands, that the discolored water extended a full mile off from the E. S. E. part, along the south side to the west end, where it extended off full 1½ mile. They are two distinct islands, connected by a reef of rocks, and well wooded, the trees on the easternmost being moderately high. The latitude of the eastern end is 17° 22′ 30″ N.; the longitude, by chronometer, from Port Royal, being 6° 56′, makes this end in 83° 48′ W.

From the Swan Island towards Balize, it is necessary to guard most particularly against the influence of the currents in running down to the shores of Honduras. They are entirely influenced by the winds, and change their direction when the wind changes; but on approaching the shoals, reefs, and keys, south of Balize, you will generally find a strong current setting to the northward, which must be guarded against by frequent observations during the night. The south-easternmost of the southern four keys is Half-Moon Key, so called from the form of the sandy shoal projecting from it. On this key the light-house is placed, in lat. 17° 12′ 30″ N., and long. 87° 27′ 10″ W., by chronometer. Here the pilots for Balize reside.

The approach to Balize from the Outer Keys is too difficult to be attempted by any one not having a thorough and practical knowledge of it.

On leaving Port Royal, January 21st, instead of steering to the southward of west for the purpose of making Rattan, and thereby ensuring a more certain route to the light-house, (on Half-Moon Key,) off Balize, I was under the necessity of keeping to the northward, to communicate near Cozumel; consequently ran down on the eastern reef, and found myself much perplexed in consequence of a very strong current, which ran to the N. N. W. upwards of 2 miles an hour. I could not ascertain the latitude of the North Key on the Eastern Reef; but ran along by the eastern edge of the reef.

The pilot was received as usual at the light-house, and sail made for English Key, past Hat Key, and Key Bokel. At this time the remarkable cocoanut trees, with a space between, showing the clear light, sufficiently point out Engligh Key. I weighed from English Key, and sounded along the shore of Turneff to Mauger Key, and now confirmed an opinion I formed two years since, namely;—that rather than beat about outside, I would endeavor to make Mauger Key, (which I would also do, if I had made the North Key on the Eastern Reef,) and run along the western side of Turneff, at the distance of from 2 to 4 miles off. When about 12 miles to the southward of Mauger Key, you will see two or three remarkable hillocks on Turneff; from these hillocks English Key will bear about W. by S. From hence you may steer across to English Key, with less chance of mistaking it, attending to the foregoing remarks,—namely, the space between the cocoanut trees. The course from Mauger Key to English Key is S. S. W., 20 miles: but I imagine there is a great risk of a stranger's being bewildered, from the similarity of the keys, near English Key, by steering directly for it; and therefore recommend running along the Turneff shore, as above, in preference.

ANCHORAGE AT ENGLISH KEY.—In anchoring at English Key, take your soundings from Goff's Key, and round towards English Key, as there is a dangerous spit off the latter, called by the pilots, the Sand Bore. With English Key bearing S. W. ½ S., and Goff's Key N. by W., there are 5 fathoms.

I have several times worked from the above anchorage to Mauger Key, and always found a southerly set; it is, however, influenced by an ebb and flow of the water, but not very strong. In the Espiegle I worked close to the edge of the reef off Mauger Key, and consider it about 2 miles off; and at night made the edge of the reef when about

2 miles to the northward of it, and 4 from Mauger Key. Therefore, unless very dark, by keeping a good look out, you may see it in time to avoid danger.

I must here caution navigators against a strong current, which almost always sets between Mauger Key and the opposite keys, about N. W.; when standing to the northward, I have most unexpectedly been set on the lee shore, when I thought myself many miles off it. This current sometimes sets westerly, and then to the southward.

I beat up to the northward during the night, keeping much to the southward and eastward, to avoid the danger of going near the Triangles. Early in the morning sail was made to the northward, and the northern end of Ambergris Key closed on, without having seen the Triangles; nor had we much northern current during the night. I must here remark, that the whole of the shore of the Ambergris Key has a reef about a quarter of a mile, or a little more off, in many places dry, and the sea breaking on all of it.

I continued working to the north towards the Island of Cozumel. The coast of Bacalar is bold, and may be approached in some places within one mile; there is a reef all along it, which, both by the color and breaking, plainly indicates itself; and off some of the projecting points they are plainly seen breaking at a considerable distance off. You have no soundings outside the reef, nor any means of ascertaining your approach to it in the night.

AMBERGRIS KEY.—The long isle called Ambergris Key, to the northward of Balize, is said to abound with extensive fresh water lakes; to produce logwood, and the more valuable kind of dye-wood, named Braziletto. In most seasons it is plentifully stocked with many kinds of game.

EL CHINCHONO.—The shoal called the NORTHERN TRIANGLE lies at the distance of 13 leagues to the northward of Mauger Key. Captain Burnett says, when the trade wind prevails, a current, often very strong, sets down between Mauger Key and the Triangle; there dividing itself, it sets to the southward, between Turneff and the Main Reef, and, to the northward, between the Triangle Reef and Ambergris Key. With a wind from E. to E. S. E., as you tail to leeward of the Triangle, you will have a strong current in your favor.

The south end of the Triangle Reef is from four to five miles broad; it makes in two points, between which there is a sandy spot. From the S. W. point, the reef trends N. by W. ½ W. to the great key on the centre of the reef; from thence N. by E. to the two keys on the north end. The course along shore to Cozumel is N. by E. ½ E., and the shore pretty bold.

COZUMEL ISLAND.—On first making the Island Cozumel, from the north-west end being much higher than the southern, you are inclined to think the island lies nearly east and west: but, on a nearer approach, it will be found to lie nearly in a N. E. and S. W. direction. There is good anchorage all along the west side of the island at about three-quarters or 1½ mile from the shore, on stiff sand and clay; the anchor may be seen. The bank running all along the western side is free from danger, and very steep to, having from 13 to 10 fathoms at one cast of the lead. On approaching the shore you plainly see the edge of the bank, which shows itself by the discolored water, and a very strong and turbulent motion, caused by the stream of current which sets very strong to the northward outside, at one mile from the shore, coming in contact with the eddy current, which sets in a contrary direction along from the edge of the bank. On first seeing this, I was somewhat alarmed; but on finding the cause, the alarm ceased.

ANCHORAGE.—The Espeigle anchored in the first bend of the coast to the southward of the N. W. point, having that point bearing N. by E., and the southern extreme S. S. W., distant off shore about half a mile. It is necessary to remark, that the land from the N. W. to the north point, falls in to the eastward, forming a long deep bight of 8 miles. About 8 miles to the southward from the N. W. point, there is a small lagoon, the entrance to which is not discernible till very near it, having about 5 or 6 feet of water at the mouth; there are many small islets all about it, and an abundance of fish of the finest quality. All along the coast there is an abundance of wood, and fish may be caught: in some places the seine may be hauled, but generally speaking, the beach is lined with small rocks near the water's edge. The south end of the island is low, and has a long sandy spit projecting from it. I have heard that fresh water is to be found, but did not see any.

Cursory Remarks on the Northern part of Cozumel Island, by Anthony de Mayne, R. N. Surveyor, February, 1820.

COZUMEL ISLAND is of a moderate height, extending N. E. and S. W., upwards of 7 leagues, and is about 2 leagues in breadth. Its east side appeared to be free from danger; but off the N. E. point a reef runs out in a N. E. by N. direction, upwards of 3 miles: this reef is steep to in every part; and there are 10 and 11 fathoms close to the breakers, on the N. E. extremity. We passed the north-eastern breakers at a distance of half a mile, having 12 fathoms, and rounding them gradually, stood into a bay on the west side of the island, and there anchored in 6 fathoms, on rocky bottom, at about 2¼

miles from the beach, with the N. E. point bearing east, distant 5 miles. From this spot we could plainly see the main land of Bacalar to the westward, which is rather low, with a number of large trees along the shore.

From observations made at this anchorage, we found the N. E. point of Cozumel situated in latitude 20° 32′ N., and longitude 86° 44′ 52″ W. The north part of the island is low and swampy, covered with thick underwood, but we observed no other than small trees; on the south part, the trees appeared much larger, but of the fustic or logwood kind.

We could not perceive any discolored water or soundings off the east side of the island; but off the north part, or end, the soundings extend to a considerable distance northward from the reef before mentioned. We found 13, 14, 20, and 16 fathoms, on rocky bottom. In latitude 20° 50′, and longitude 76° 40′ we had 16 fathoms, on rocky bottom; with strong rippling caused by the current, similar to the Gulf Stream, the set being N. by E., 2½ knots; at this point the bank appeared to terminate.

We found the current to the eastward of Cozumel setting N. by E., at the rate of 2 knots; but to the westward, between the island and the main, it ran south-westward, at the rate of 2½ knots.

From several observations, the variation of the compass was found 7¼°, easterly.

The main land opposite to Cozumel, trends about N. N. E. ½ E., to the island Mugeras, and is all low and woody.

THE COAST AND RIVERS OF GUYANA, FROM THE EQUATOR AND THE AMAZON, WESTWARD TO THE GULF OF PARIA, OR TRINIDAD.

THE COAST OF GUYANA, IN GENERAL.—The country comprehended under the name of Guyana, extends southward from the River Oronoco to the River of Amazons. The coasts of it are generally low; as the numerous rivers bring down vast quantities of alluvial matter, which, accumulating on the shores, has formed a border of low ground. This ground, between the high and low water marks, is commonly covered with mangroves; at low water, it appears like an inaccessible bank; but with the rising tide, it is inundated.

PORTUGUESE GUYANA.—The Amazon is considered as the first or largest river in the world. Mr. Pinkerton has said, "among the grand rivers which water the globe, and diffuse fertility and commerce along their shores, the Amazon will ever maintain the preference." The truth of this averment seems to be unquestionable; the sources of this river being within two degrees of the Pacific Ocean, about the parallel of 11° S., and several great rivers fall into it; these again having innumerable branches. The course of its grand stream is nearly east, across the continent, until it falls into the Atlantic, under the equinoctial line. The river is said to be navigable through nearly its whole length, though impeded by many banks of sand, some of which extend 30 or 40 leagues. Below its confluence with the River Xingu, at 40 leagues from the sea, its opposite banks are invisible from each other. At Ovidos, more than 140 leagues from the sea, its breadth is about 1000 fathoms. The tide is perceptible to the distance of 150 leagues.

The declivity of the bed of the river, from Ovidos, has been computed at only four feet; yet the immense body of interior water gives it an astonishing impetus; so that it rushes into the sea with amazing velocity, and is said to freshen the ocean, at times, to the distance of nearly 80 leagues from the shore. This rapidity, on the return of tide, occasions a bore, called by the Indians, *pororoca*, which is chiefly observable towards Cape North, and which surpasses those of other great rivers. This phenomenon always occurs two days before and after the full and change of the moon; when at the commencement of the flood, the sea rushes into the river, forming three or four successive waves, that break mountains high on the bar, and raise the tide within to its greatest elevation in one or two minutes. It has been said that the elevation of these ridges of water has amounted to not less than 200 feet; but the ordinary rise over the bar, is from 12 to 15 feet. The noise of the irruption may be heard at the distance of two leagues.

FRENCH GUYANA.—The coasts of French Guyana are much like those of the Portuguese or Brazilian territory, and present nothing remarkable to the navigator; the whole being lined by drowned mangrove isles and mud banks, which bar the mouths of the numerous rivers. The rains on this coast prevail from January to June, and form

stagnant ponds and marshes, which render the climate very unhealthy. The currents along the coast are strong and irregular.

The only town is that of Cayenne, situated on an isle, or rather delta, called Cayano; hence the whole territory is commonly styled Cayenne. The situation of this place was ascertained by M. la Condamine, in 1774, from four eclipes of the first satellite of Jupiter, &c., who has given it as in 4° 56′ 15″ N., and 52° 16′ 30″ W., a position since generally adopted.

The coast is in many places dangerous, having extensive banks of sand and mud, with numerous rocks; some of the shoals reach to the distance of two leagues from shore.—The isle Cayano lies between the rivers Onya and Cayenne; the latter has, near its entrance, only 12 and 13 feet of water, with soft mud interspersed with rocks. The town is situated on the N. W. side of the island; it is generally described as a wretched place, the streets steep and narrow, and paved with sharp stones. The harbor, which is a tolerable one, is supposed to have determined the choice of settlers in fixing on this situation.

There are several islets off Cayenne, as exhibited on the charts; of these the outer ones, called the Constables, or Gunners, are the most conspicuous; they being barren rocks, whitened with birds' dung. The Malingre, and other isles to the eastward of Cayenne, are very steep. On one of these is an hospital for lepers, a malady very common on the Cayano Island. These isles, &c., are more particularly described hereafter.

DUTCH AND BRITISH GUYANA.—Dutch Guyana, or Surinam, extends from the Marrowyne to the Corantine, an extent of 170 miles; and British Guyana, from the Corantine to Essequibo, an extent of about 120 miles.

General Directions for the Coasts of Dutch and British Guyana.

Ships bound from the windward, or Caribbee Islands, to these coasts, should steer as far to the eastward as S. E., if the wind will permit, on account of the strong indraught, or current, setting all times of the year to the westward, into and through the Gulf of Paria. The moment you come on to the outward edge of the ground, you will perceive the color of the water change to a light green, and will have from 35 to 45 fathoms. If in that depth you should be so far to the southward as 7° 25′, or 7° 30′ north latitude, you may steer in S. W., and make the land; but if more to the northward, keep your wind till you attain that latitude, you will have very gradual soundings quite to the shore, but very shallow; you will be in 9 fathoms when you first get sight of the land about Demarara; but you may run in without fear in 4 fathoms, being attentive to your lead. As it is the general opinion that there are many unexplored sand banks on this coast, a great attention to the lead and the quality of the ground will be necessary, as by that only you will be apprised of the danger; for, on most parts of this coast, to the eastward of the River Oronoco, the bottom is of very soft mud; if, on a sudden, you find hard sandy ground, be assured some danger is near, and immediately haul off, till you again find soft ground, as before.

The making of the land all the way from the Oronoco, as far to the eastward as Cayenne, is very low and woody, and therefore appears in all parts so much alike, that the most experienced pilots are frequently deceived. Your chief dependence therefore is in a true altitude; if that, by reason of thick weather, cannot be obtained, it will be advisable to anchor in about six fathoms, which you may do with great safety, having good ground, and in general moderate gales and smooth water.

The making of the land about Demarara is the most remarkable of any part of the coast; the woods in many places being burnt down, and cleared for cultivation, makes the land appear in large gaps, where the houses, &c. are plainly to be seen; and if there are any ships lying at the lower part of the river, their mast heads may be plainly seen above the trees, for some distance at sea.

If bound into the Demarara, you must run to the westward till you bring the entrance of the river S. S. W., or S. by W., and either lie to, or anchor for the tide, in 4 fathoms of water; but be very cautious not to be hauled farther to the westward than these bearings, for the flood runs very strongly into the River Essequibo, at the mouth of which, and at a great distance from the land, lie many very dangerous sand banks, on some of which there are not more than 9 or 10 feet of water, and the flood tide sets directly on them.

On many parts of this coast, particularly off Point Spirit, a league to the eastward of the Demarara, the flood tide sets directly on the shore, and the ebb sets off to the N. E. It will be advisable, when calm and near the land, to anchor there.

In the month of December, there is, at times, particularly in shoal water, on the coming in of the flood, a great sea, called the rollers, and, by the Indians, pororoca. It is often fatal to vessels at anchor. The early navigators have been puzzled to assign a cause for this phenomenon, which is occasioned by the northern winds blowing on the shoal water.

It is to be observed, generally, that on a great extent of the coast of Guyana, the sides of the rivers and creeks are almost every where covered with thick forests. The

immense plains of natural salt swamps, which lie between these forests and the sea coast, (commonly called savannas,) were also formerly covered with forests, which have been destroyed by means of fire. Much brush-wood, however, has since grown up, the branches and roots of which are so interlaced with each other, as to prevent penetrating through them even in boats. The greatest part of these savannas contain so much water, which flows into them during the rainy season, that the greatest heat of the dry season is insufficient to drain them. The land, therefore, cannot be cultivated.

At the distance of between 12 and 40 leagues from the coast, the wind generally prevails from the E. S. E., but within 12 leagues the wind is variable: in the morning S. E., and E. S. E. towards noon, drawing round to the east; and between 2 and 8 it is generally to the N. E. and N. N. E., or north. In the night it varies from E. by N. to E. by S.

To get to the windward on this coast, care must be taken not to suffer the southerly winds to take you more than 10 leagues from the land, at which distance you should be about noon; for by two hours after, the wind may prevail so far to the north, as to lay you along shore. By 8 in the evening the north wind has generally subsided, and the wind then blows along shore from the eastward: therefore, with a whole ebb before you, it may be best to anchor and stop for a tide. By daylight the wind will be found to have changed to west, southerly: hence the advantage of being near shore. Thus proceeding, and taking advantage of the tides, a ship may beat from Demarara to Surinam in the space of three or four days.

SURINAM, or DUTCH GUYANA.—The River Marowyne forms the eastern boundary of the province. This river, which is but little frequented, empties itself into the sea by channels formed between several alluvial banks. The mouth of the river above these is three miles in breadth, and the stream is navigable to a great distance.

OF SURINAM RIVER, the entrance is three miles broad, and there is a depth over the bar of from 12 to 18 feet at low water; and from 21 to 30 at high water. The depth within is greater; but this is interrupted by two bars within the river, which are exhibited on the charts.

PARAMARIBO, the chief town, is on the western side of the river, between 4 and 5 leagues from the sea.

The approach to the town is defended by several works on each side of the river. Of these, Fort Amsterdam, at seven miles up, on the eastern side, is the most considerable. Fort Zelandia, below the town, is separated from it by an esplanade, and protects the shipping in the reach of the river before it, which will contain 100 sail.

The river is navigable for large ships to the distance of 12 miles within land, and 60 miles higher for small vessels. The banks, quite down to the water's edge, are covered with evergreen mangroves, which render its navigation extremely pleasant.

RIVER SURINAM.—It is advisable for ships bound for Surinam, when coming from the eastward, or long voyages, to get into latitude 5° 55′ N., in the longitude of 50° (unless they have a time keeper, or lunar observation, which may be depended upon;) as by that means they will have an opportunity, from observation to observation, of ascertaining the current, which almost constantly, off the Marowyne, runs to the N. W.; and you are also to observe that, during the rainy season, you cannot always depend on a meridional observation.

When you have gained ground in the above latitude, (and be sure to sound in time,) 60 to 40 fathoms, fine sand, you will be 40 to 20 leagues to eastward of Marowyne Shoals; and you may not, in the night, approach nearer to them than 10 fathoms, when the soundings will be gradually coarser. In hauling to the northward you will have deeper water and finer sand; and in 10 fathoms water, heaving to with your head to the northward, you will drive clear enough of the shoals to the N. W. You will always know whether you are to the eastward, and consequently to the windward, by those soundings: for the ground, six leagues to leeward of the Marowyne, all the way to Bram's Point;* is soft mud. Your best landfall will be between Post Orange and the Marowyne: indeed it is absolutely necessary that you should make the land thereabout. The Marowyne is known by the only high land near the coast, and appears, when you make it, at a great distance inland, and bringing it to bear south of you, you will be clear of its shoals; and had better then stand in until you are in 3 fathoms of water.

In making Post Orange, which has often been mistaken for Bram's Point, and which error has occasioned the loss of many ships, † observe that there are many large white

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* Bram's Point is the eastern point of the entrance of Surinam River. A beacon, 70 feet high, has been erected about a mile to windward of the point, on which is a broad tin vane, painted white. When this vane is first distinguishable from any vessel coming from the eastward, she may be reckoned on the edge of the Mud Bank. The body, or frame of the beacon, is boarded around, and painted white. There are also two flag-staffs, the eastern one for signals, and on the western the colors are hoisted, and at a distance appear to be almost in the water.

† As the name of Post Orange does not appear on some charts, it may be proper to notice that it lies 13 leagues to the eastward of Bram's Point.

houses, which are barracks; and in the middle of them appears a large tree, which, when bearing south of you, makes like a ship with top-gallant-studding-sails set; and the flag-staff also appears among the trees; and those trees show to be nearer the houses; whereas Bram's Point has two large houses, a beacon erected in 1817, and the trees are on the other side of the river, as shown on the Chart of Surinam.

SURINAM.—You will then keep on the edge of the Mud Bank, (well described on the chart,) in from 3 to 2½ fathoms, or as near as your draft of water will permit; and you need be under no apprehension in steering along the coast, if you touch, as the mud is very soft; and, on the Mud Bank, the moment you haul to the northward, you deepen your water; for, on the whole of this bank, it deepens gradually, from 2 to 3½ fathoms, and then you are on the outward edge of it.

The next mark you have, (for you must be very attentive in keeping a good lookout,) is a break in the land, which has been cleared for a plantation, with two houses; the trees on each side having been burnt, appear very brown, and in making it in 3 fathoms of water, 4 leagues off, you will be from 3 to 4 leagues to the eastward of Bram's Point, which forms the eastern entrance of Surinam River. If it be evening, or ebb tide, you had better haul to the northward, and must anchor when you have 4 fathoms of water, as the current would, during the night, drift you, (should you lie to,) as far to the westward as the Saramacca; and many ships have been three or four weeks beating back to Bram's Point, although the distance is only 7 or 8 leagues. Nay, heavy sailers, after beating many weeks, have borne up for Berbice, finding it unavailing to contend against wind and current.

BRAM'S POINT may be readily known by the beacon with a vane, at a mile to the eastward of it, and two flag-staffs, which have already been noticed. You will, on the flood, when it bears S. S. E., haul in, keeping the point open to the larboard bow. Steering thus, you will clear the shoal that runs out to the northward of it; and you are in the fair channel way, and may go within hail, when there is good anchorage in 4 fathoms of water; observing the best anchorage is within the point half a mile. The course up the river from its entrance to Fort Amsterdam is S. E. On getting within this point, keep the eastern shore on board, as then, all the way up, until you reach Paramaribo, is the deepest water. About three miles within the point you have only 2 fathoms at low water: and from thence to within two miles of the entrance of the Comowinie, may not be improperly termed the lower bar; it extends about three miles.

In approaching close to Bram's Point from the sea, you may naturally, if a stranger, apprehend danger from several wrecks that lie on the point; but these are old vessels that have been brought from Paramaribo, and placed there as break-waters; as, at some seasons, the sea breaks upon the point.

Having reached nearly to the entrance of the Comowinie, which branches from the Surinam, you must be very particular in guarding against the flood, which sets strongly into the Comowinie, and which, without great precaution, would set you on a spit of sand, which extends from Fort Amsterdam almost across the Comowinie. On the other hand, you must guard against some sunken rocks which lie a little below Fort Amsterdam, on the western shore, so as to keep between the two. Having passed the flag-staff, you will have 18 feet at low water; and from thence to the edge of the bar, the deepest water in the river. It is here that those ships complete their lading, which draw too much water to pass over the bar.

At Tiger's Hole there are 6 fathoms of water, which is just above Governor Frederici's plantation, called Voorburg. Here you will then have a leading wind up; and by keeping three-quarters over to the eastern shore, you will have the deepest water, 11 feet at low, and 18 feet at high water. You may anchor abreast of Paramaribo, in 4 fathoms, observing that the deepest water is close to the town.

We shall conclude by these general descriptions:—That you will be near, and to windward of the Marowyne, with coarse ground; that, hauling to the northward, the ground will gradually become finer and the water deeper: and to leeward of the shoals, a sandy coast and ooze; that it is necessary to keep on the edge of the bank, in from 2½ to 3 fathoms, and in the rainy season, rather anchor too soon: or if you are in the least doubtful, or should you sail a few leagues to leeward, even in a fast sailing vessel, you would have much difficulty and length of time in turning back; and that, in observing these precautions, you cannot fail to make the land properly.

It is high water, at full and change, at Bram's Point, at 6 o'clock. The flood sets to the westward, ebb to the eastward.

BRITISH GUYANA.—The River Berbice, as a harbor, is of minor importance, there being a depth of only 7 feet on the bar at low ebbs. This bar is 2 leagues from the entrance of the river. The low isle within, called Crab Isle, is so named from the number of land crabs which are found upon it.

New Amsterdam, the chief town, is situated at 2 miles above Crab Island, on the eastern bank. It is intersected by canals, which have the advantage of the tide. The govern-

ment and public houses are of brick, and handsomely built. The entrance is protected by three batteries.

In sailing for the coast of Demarara from the northward, you must keep well to windward, as the general set of current along the coast is W., or W. N. W., about 2 miles an hour.

At the distance of 20 miles off shore, the currents vary according to the wind, and it may be observed, as a general rule, that when there is any westing in the wind, a strong easterly set will be found along the whole coast; and that when the wind inclines to the eastward, the set will then be westerly.

The trade wind blowing between N. N. E. and S. E. causes the westerly set usually found; but as the wind occasionally veers to the northward, and even so far as N. N. W., particularly in the winter months, the easterly current above alluded to sometimes exists.

The flood tide sets along the coast S. W., and the ebb N. E. Their influence is not felt beyond 8 miles off shore.

As the passage from Demarara to Berbice, or other ports to windward, exposes you to the general westerly current, it is well to keep close in shore, and take advantage of the in-shore tides; and should the winds be light, it will be necessary to anchor with the flood.

Cruising to windward in the Arachne, we found the trade wind incline so much to the northward as to enable us to lay up E. and E. by N., when we found the easterly set, as before mentioned, running at least 2½ knots an hour. This, however, is not common, and ought not to be calculated upon in making a passage to windward, unless the wind, as previously noticed, enables you to lay E. by N., or E.

The color of the water along the coast, to 19 miles off shore, is thick and muddy, and on many parts of it there are very dark patches, apparently shoals, but the soundings on them are the same as the water surrounding them.

Off the mouths or entrances of the different rivers, the bottom is hard, but in general along this coast it is mud.

In working to windward, stand no nearer the shore than 4 fathoms, nor off beyond 9. You will then be enabled to take advantage of the regular ebb and flood in shore.

Appearance of the Land on the Demarara Coast.—Nine miles to the eastward of Cocobano Point are five or six single cocoanut trees; ten miles farther to the eastward are two rows of the same trees, appearing like white cliffs.

Twenty-six miles to the eastward of the river there is a hillock, formed by a large cotton tree. This towers above the low land, and forms like a sugar-loaf: it is called General Murray's tree.

General Murray's Tree, S. W. by S. 12′.

Forty-six miles to the eastward of the river are two hillocks close together. They also form like sugar-loaves, and show themselves above the low land.

Two Cotton Trees, S. S. W. 11′.

Vessels on the coast of British Guyana, and bound to Demarara, will clearly make these objects, as they alone alter the appearance of the low land.

Crab Island, at the entrance of the River Berbice, will point this part of the coast out, there being no other island between Demarara and Surinam.

Fourteen miles to the eastward of Berbice there is a building close down to the water; its sides and top are white, and a little to the westward of it is a deep gap in the land.

Fifty miles to the eastward of Berbice there is a patch of burnt trees, having the appearance of vessels at anchor.

The intermediate coast between these objects is low; patches of trees, and a few dispersed houses, alone altering its appearance.

There is no danger, if the lead is kept well going.

Unless standing in for a harbor or river, do not go into less than 5 fathoms, as there are many banks but little known inside these soundings. There is anchorage along the whole coast, but be careful, if you anchor off Berbice, to have sufficiently deep water to prevent touching the bottom between the hollows of the rollers, which break.

The pilotage going in and out of Demarara being so heavy, it is advisable to anchor outside, being 4 or 5 miles off shore, and Cocobano Point bearing W .S. W. 6 or 7 miles, is the best anchorage.

THE HARBOR OF DEMARARA.—This harbor is formed at the entrance of the river of the same name, Point Cocobano, which has a light-house on it, being the eastern point of the harbor.

It is a bar harbor, the bar running north and south from Point Spirit, which is 5 miles to the eastward of Cocobano Point.

At high water you will have on it 15 feet; high springs, 16½ and 17. The rise and fall is 9 feet.

Directions to sail for the River.—Being to windward, and running for the river, keep at the distance of 4 or 5 miles off shore, in 4½ and 5 fathoms. Sixteen miles to the eastward of the river are two very remarkable rows of cabbage trees. Three miles to the westward of them are seven single ones. These trees have the appearance of white cliffs.

Having passed these, stand on with the same soundings until you see Cocobano Point, which is low, and the northernmost point of land, and has a light-house on it. Steer about west, until the light-house bears S. S. W.; then steer S. W., until the light-house bears south; then steer S. W. by S., until it bears S. by E. You will then have the river and ships open; steer for the light-house, and you will have a white buoy on your left, and a black on your right. Your anchorage is abreast of the light-house; it will bear E. ½ S.; at low water you will have 17 feet. The flood runs two knots and a half, and the ebb three knots an hour. The holding ground is good, being mud and clay.

In working out you must not bring the light-house to the westward of S. W. by W., or to the southward of S. by W.

The water that is generally used is rain water. In the dry seasons it would be necessary for a ship in want of water to go 15 or 20 miles up the river, where it is quite fresh and good.

The pilots for this harbor are very good, and keep a sharp lookout for vessels coming down, picking vessels up 15 and 20 miles to the windward of the river.

It is high water (spring tides) at George Town at 4h. 45m. P. M. Rise at ordinary springs, 9 feet; at neaps, 8 feet. The tide continues to flow on the surface 1h. 10m. after high water, and during spring tides runs about three knots per hour at the anchorage, in the dry season, from July to November.

The distance from George Town to the sand hills up the river is about 25½ miles, by Capt. Owen's survey. In going up to the sand hills keep the eastern shore close on board, after passing the flats off Providence, until abreast of Howereroenie Creek; then haul over towards the point on the west shore above Glasgow.

The light-house is in lat. 6° 49′ 20″ N., long. 58° 11′ 20″ W.; variation, 5° 43′ E., by Capt. Owen's observations.

SPANISH, or COLOMBIAN GUYANA.—The most remarkable feature of Spanish Guyana is the course of the River Oronoco. A great part of the upper portion of this river was explored in the year 1800, by the celebrated Humboldt, who proved its communication with the Rio Negro, and, consequently, with the Amazon. The mouths of the Oronoco are of dangerous navigation, and require an expert pilot. Seven of them are navigable; but the chief is the Great Mouth, (Boca Grande, or Boca de Navios,) which is about 6 miles in width. This is most to the southward, and in the direct course of the river. The isles of the Oronoco, or rather its Delta, which is of prodigious extent, are possessed by the Guaraunas and the Mariusas, two independent tribes of Indians. The northern part, opposite to Trinidad, is overflowed from the middle of January to the middle of June; and, during this season, the Guaraunas dwell upon the palm trees with which it is covered.

The seven navigable channels into the river, already mentioned, have been described as follow, commencing northward:

The first of the navigable mouths is the Grand Manamo, in the Gulf of Paria: the second is the Cano, or Canal of Perdernales, 3 leagues south of the Soldier's Island, at the entrance of the gulf; it is fit for long boats only: the third mouth, named Capura, is 7 leagues to the eastward of Perdernales, and, likewise, is fit only for boats: the fourth, named Macarco, is 6 leagues eastward of Capura, and is navigable by small craft: Mariusas, the fifth, is 12 leagues to the south-eastward of the fourth; but between are many mouths navigable when the river is high: the sixth mouth is 18 leagues to the southward of Mariusas, and is navigable for small vessels: the seventh, Boca Grande, or Great Mouth, is 8 leagues S. E. from the sixth; its breadth is 6 miles between the islands, Congrejo (Crab Isles) on the N. W., and Point Barma on the S. E.; but the navigable channel is not above 3 miles, and is crossed by a bar, with 17 feet at low water: the approach to this entrance is dangerous, from the shoals running off 7 miles eastward from Congrejo Island, and 2 miles northward from Point Barma.

The flux and reflux of the tide, are felt in the month of April, when the river is lowest, beyond Angostura, at a distance of more than 85 leagues inland. At the confluence of the Carony, 60 leagues from the coast, the water rises one foot three inches. These oscillations of the surface of the river, this *suspension* of its course, must not be confounded with a tide that flows up. At the Great Mouth, near Cape Barma, the tide rises to a height of two or three feet; but further to the N. W., towards and in the Gulf of Paria, the tide rise 7, 8, and even 10 feet. Such is the effect of the configuration of the coast, and of the obstacles presented by the Bocas del Drago, &c.

The currents on the whole of this coast run from Cape Orange towards the north-

west; and the variations which the fresh waters of the Oronoco produce in the force of the general current, and in the transparency and the reflected color of the sea, rarely extend farther than three or four leagues E. N. E. of Congrejo, or Crab Island. The waters in the Gulf of Paria are salt, though in a less degree than in the rest of the Caribbean Sea, attributed to the small mouth (Bocas Chicas) of the Oronoco, and the mass of water furnished by the river Guarapiche. From these reasons there are no salt pits on this coast.

The navigation of the river, whether vessels enter by the Great Mouth or by the labyrinth of the Bocas Chicas, requires various precautions, according as the bed may be full or the waters very low. The regularity of these periodical risings of the Oronoco has long been an object of admiration to travellers, as the overflowings of the Nile furnished the philosophers of antiquity with a problem difficult to solve. The cause is similar, and acts equally on all the rivers that take their rise in the torrid zone. After the vernal equinox, the cessation of the breezes announce the season of rains. The increase of the rivers is in proportion to the quantity of water that falls in the different regions. This quantity, in the centre of the forests of the upper Oronoco, and the Rio Negro, appeared to me to extend 90 or 100 inches annually. The following is the usual progress of the oscillations of the Oronoco. Immediately after the vernal equinox, (the people say on the 25th of March,) the commencement of the rising is perceived. It is, at first, only an inch in 24 hours: sometimes the river again sinks in April; it attains its maximum, or greatest height, in July; remains full, (at the same level,) from the end of July till the 25th of August, and then decreases progressively, but more slowly than it increased. It is at its minimum, or least depth, in January and February.

The River Amazon, according to the information which I obtained on its banks, is much less regular in the periods of its oscillations than the Oronoco; it generally begins, however, to increase in December, and attains its greatest height in March. It sinks from the month of May, and is at the lowest height in the months of July and August, at the time when the lower Oronoco inundates all the surrounding land. As no river in America can cross the equator from south to north, on account of the general configuration of the ground, the risings of the Oronoco have an influence on the Amazon; but those of the Amazon do not alter the progress of the oscillations of the Oronoco. It results from these data, that, in the two basins of the Amazon and the Oronoco, the concave and convex summits of the curve of progressive increase and decrease correspond very regularly with each other, since they exhibit the difference of six months which results from the situation of the rivers in opposite hemispheres. The commencement of the risings only is less tardy in the Oronoco. This river increases sensibly so soon as the sun has crossed the equator; in the Amazon, on the contrary, the risings do not commence till two months after the equinox.

Foreign pilots admit 90 feet for the ordinary rise in the lower Oronoco. M. de Pons, who has, in general, collected very accurate notions during his stay at Caraccas, fixes it at 13 fathoms. The heights naturally vary, according to the breadth of the bed, and the number of tributary streams which the principal trunk receives. It appears that the mean rise of Angostura does not exceed 24 or 25 feet.

When vessels that draw much water, sail up towards Angostura, in the months of January and February, by reason of the sea breeze and the tide, they run the risk of taking the ground. The navigable channel often changes its breadth and direction; and no buoy has yet been laid down to indicate any deposite of earth formed in the bed of the river, where the waters have lost their original velocity.

General Description of, and Directions for, the Coast of Guyana.

[From the "Derrotero de las Antillas," &c.]

The coast, which extends from Cape North to the Great Mouth of the Oronoco, which is in latitude 8° 41′ N., is very low, and soundings off it reach out a great way to sea. This circumstance is the only mean of ascertaining with certainty the proximity. Any other mode of recognizing the coast is very difficult: for, in the clearest day, it is not possible to discern the land at five leagues off; and the nature of the coast itself impedes a nearer approach than two leagues, on account of the shoalness of the water, and the banks of sand and mud of great extent with which it is obstructed.

The harbors on this coast are the mouths of rivers only, all of which have bars, more or less navigable; and to enter, a practical knowledge is necessary.

From North Cape to Cape Cassapana, the land is very low and wet, and covered with a thick wood, without any other mark to recognize it by, than the hill or mount of Mayes: a kind of platform, insulated and hilly, which may be seen, in clear weather, at the distance of five or six leagues. Its latitude is 3° 5′ N. The soundings hereabout extend far out to sea. You may sail along the coast at three leagues from it, and at that distance have from 8 to 10 fathoms. At 10 leagues from land, the depth increases to 15 and 20 fathoms: and, at 15 and 20 leagues distance, there are from 25 to 30 fathoms,

with bottom of soft clay, or of fine sand of various colors. The current runs N. N. W., but, close to the shore, varies according to the tide, of which the flood runs W. N. W. and the ebb N. E., at the rate of about three miles an hour. It flows at six o'clock on full and change days, and rises from 12 to 15 feet.

The general velocity of the current, outside the influence of the tides, may be estimated at two miles an hour. On this account, in making this coast, it is always necessary to make it in less latitude, (i. e. more to the southward,) than that of your port of destination. It is the custom of those bound to Cayenne, to endeavor to strike soundings about N. E. from Cape North, and 20 or 30 leagues from it, at which distance they find from 40 to 50 fathoms of water.

Cape Cassepour lies in latitude 3° 50′: near it there is a great bank of clay, which extends 5 or 6 leagues out to sea: its extent, from N. to S., is about 4 leagues, with 4 and 5 fathoms of water upon it. On account of this, vessels from the southward, making this cape, ought not to run along the shore nearer than 5 or 6 leagues. After having passed this bank, Cape Orange bears W. by N., distant from 6 to 7 leagues; and, although from this place it cannot be discovered, yet its proximity may be ascertained without any doubt: for, steering north, you will deepen the water from 5 to 10 fathoms, in running less than a mile; when you find this latter depth, you ought to steer W. N. W., (or even west, if necessary,) to preserve the same depth. It is to be remarked that, when a vessel is near Cape Cassepour, and in 5 fathoms of water, she ought not to be steered so as to maintain that depth; but that it is necessary to steer north, or even N. by E., until you get 7 fathoms of water, when you will no longer be able to see the land from the deck, as it is very low. After steering the same course for a short time, in 7 fathoms, you may steer N. N. W. and N. W., with the same depth: with these courses you will near Cape Orange, insensibly, and make it at the distance of 2 or 3 leagues, when in 8 or 9 fathoms of water. Between this cape and Cape Cassepour, the river of that name disembogues itself.

Cape Orange may be known by a cut point, (Punta Cortado,) or rather, more properly, a point which seems to have been cut or shortened, which is on the side next to the sea, and is the highest land to the S. E of the same cape; and also by the Silver Mountains, which form various peaks, appearing insulated and detached the one from the other, and which are the more remarkable, as they are the first high land discovered in coming from Cape North. Approaching Cape Orange, you may discover various remarkable hills, over the point which forms the entrance of the River Oyapoc.

Beyond Cape Orange the coast forms a bay, of 4 leagues in breadth, in which the great River Oyapoc disembogues itself, and into which also two other rivers of small consideration discharge their waters; the one to the eastward is named Coripe, and that to the westward is called Warnari. The Silver Mountains serve not only as a mark for Cape Orange, but also for this bay; because, beginning to rise on the west coast, in a swampy country, they come down almost to the edge of the sea.

The River Oyapoc is two leagues wide at its entrance; and you may anchor in it in 4 fathoms, clayey bottom, keeping Warnari west, at the distance of three-quarters of a league. Mount Lucas is a small, but tolerably high hill, on the point which divides the rivers Warnari and Oyapoc. One league up the river, (Oyapoc,) there is a low island, named Isla de Venados, which is covered by very high tides. You may pass to the westward of it, where you will have 4 fathoms of water close to the shore. After the Isla de Venados, there are some other small islands, which do not embarrass the navigation of the river. After sailing up the river 5 or 6 leagues, there is a fine bay, which serves as a harbor, and in which you may anchor in 4, 5, or 6 fathoms of water, and as near the shore as you please. At this place there is a small fort and a country-house.

About 12 leagues to the N. W. from the River Oyapoc, is the River Apronak, which, also, is of some importance. Its entrance is two leagues wide, and it has from 3 to 4 fathoms of water. The lands which form it are very low, marshy, and covered with mangroves. Two leagues up the river, and in the middle of it, there is a low and very narrow island, of about half a mile in length, covered with wood, and named Fisherman's Island. To the north of it a bank of sand stretches out more than two miles, to which it is necessary to give a berth when you enter into the river. There is a channel on each side of the island. The one to the eastward has 3 fathoms of water, but that to the westward not more than 2 fathoms.

Five leagues north of the mouth of this river there is a tolerably high bare island, in shape resembling a half-orange; it is called the Great Constable, to distinguish it from a smaller island, which lies half a league from it, nearer the coast, almost level with the water, and which is called the Little Constable.* The Great Constable, (or Gunner,) may be discovered 8 or 10 leagues out at sea. Vessels bound to Cayenne, direct their course to these islands from Cape Orange, from off which they bear N. N. W., distant

* These are the Gunners of the English charts.

18 leagues. In this passage it is necessary to keep in 8 or 9 fathoms. The Great Constable has 3 fathoms of water all round it, and is very clean. The little one lies E. N. E. and W. S. W. with the great one. You may pass between them in 8 or 9 fathoms of water, observing to keep within two musket shots of the great one, and to leave the little one on the larboard hand.

N. N. W. from the Great Constable, there is a rocky shoal, which some place at two, others at three, and others even at four miles distance from it. To avoid this shoal is the principal reason for passing between the Constables. The French ship of war La Gironde, bound to Cayenne, in 1738, after having passed between the Constables, leaving the great one on the starboard hand, steered N. W. by W. for the Mother and Daughters, and soon after discovered the water breaking upon what appeared to be rocks, which bore N. by W., about a league distant. At the same time the Great Constable bore E. by S., and the little one S. by E. From this it appears that the shoal lies N. 39° W., true, from the Great Constable, at the distance of 4 miles. Its extent may be about 5 cables' length, and it lies N. W. and S. E.

The course from the Great Constable, to pass outside the Mother and Daughters, which lie about 6 leagues distant from it, is N. W. by W.; with this course you will shoalen the water, and will not have more than 6 fathoms near the Malingre, (one of the Mother and Daughters,) near the N. N. E. part of which you may anchor in 3 fathoms, at low water.

Four leagues* N. W. from the Apronak is Kan River, and from it to the River Orapu, is reckoned 5 leagues more. The River Orapu separates Cayenne on the east from the main land. It is a fine river, its entrance being about a league wide, and has 3 fathoms, at low water. The banks are pretty high, and covered with large trees.

CAYENNE.—The Island of Cayenne is about 6 leagues in extent, from north to south, and its greatest breadth may be 3 or 4 leagues. On the north it is bounded by the sea; on the west by the River Cayenne; on the east by the River Orapu; and on the south by a branch formed by the rivers Orapu and Cayenne, which here unite.

The City and Fortress of Cayenne are situated on the N. W. point of the island, the north part of which has various hills and eminences, but the south part is low and wet, in the season of the rains. The harbor is to the westward of the city, in the mouth of the River Cayenne. The hills, or high lands, of which we have spoken, are named Du Pont, Remontabo, Mount Joly, and Mahuri; and all these are close to the north coast. A little inland are those of Baduel, Tigres, Papaguay, and Mathory; and upon the banks of the Ouya, that of the Franciscans.

At about a league, or a league and a half, or something more, from the Island of Cayenne, are the Islets of Remire; they are five in number, viz., the Child, the Father, the Mother, and the Two Daughters. The last are two little rocks, very close together, and about a mile distant from the Mother, to the E. S. E. The Father is the largest of all these islets, and bears E. N. E., true, from Mount Joly, on the eastern coast of Cayenne Island, 4 miles distant. It may be about half a mile long, E. S. E. and W. N. W.

The Child is very small, and lies about a league E. N. E. from Mount Remontabo, and four miles from the Father. You may pass without them at three miles, or a little less distance, without any risk, and with a certainty of not having less than 5 or 6 fathoms of water. Betwixt these islets and the coast there are about fifteen feet of water, at low ebb, but the passage is dangerous, on account of a rocky shoal which lies in mid-channel, almost even with the surface of the water. There is also a shallow, which extends between the Father and Child; this shoal lies N. N. W. from Mount Joly, and nearly east from Mount Remontabo. Round the Malingre, the bottom is very shallow, and it is said that a reef stretches out about two cables' length N. N. W. from its western extremity.

Besides these isles there is another, at about three leagues to the W. N. W. of the Child, called the Forlorn Hope, or the Lost Child, which lies nearly on the meridian of the town of Cayenne, at the distance of seven miles.

In order to enter Cayenne, it is first absolutely necessary to anchor between Malingre and the Forlorn Hope, both for the purpose of receiving a pilot, and to wait for the tide, so as to pass the shallows at the entrance of the harbor. Between the Child and the Father, the anchorage is very incommodious; for the N. E. winds raise much sea in it, which, catching vessels on the beam, makes them roll as if in a storm. An anchor is very apt to drag, and it is necessary to have another all ready to let go; and often three or four days elapse, in which no communication can be had with the shore. In this anchorage there are from twenty to twenty-five feet, at low water, the bottom being of clay.

In general, vessels anchor to the E. N. E., N. E., or north. of the Child, at the distance of two miles; but there are some who anchor to the E. N. E. or N. E. of the Forlorn Hope, at about two miles distant from it. From the east to the south of the

* The original says six leagues, which distance appears to be too great.

latter, the depth of water diminishes to 15, 12, or even 10 feet; and you must take good care not to place yourself between it and the coast, because there is even less depth. In this place the tides rise 7 or 8 feet: and it is high water, on full and change days, at 5 o'clock.

N. W. by N. from the Forlorn Hope, at the distance of 8 or 9 leagues, are three small islets, which are so placed as to form a triangle. They are called the Devil's Islets. They form a fine and well sheltered harbor. The best anchorage at them is E. S. E. of the most southerly islet, in 5 or 6 fathoms of water, with a hard clay bottom, at about a musket shot's distance from the islet. In this islet there is a reservoir of fresh water; but it is necessary to get the water with small kegs, which can be carried, as the roughness and steepness of the ground render it impossible to get it with large casks.

Between these islets and the Forlorn Hope there are 5, 6, and 7 fathoms of water, at 3 or 4 leagues from the land; near the Devil's Islets are 9, and leaving them to the S. or S. E., you will have 20, 30, and 40 fathoms, increasing your depth as you increase your distance from the islets.

Six leagues N. W. from Cayenne is the River Macouria. The coast between is low, level, and has many handsome houses. At 15 leagues N. W. from Macouria is the River Sinamari. This river affords excellent anchorage at 2 or 3 leagues from its mouth, in which vessels are not incommoded by the sea, because the bottom is of very soft clay.

Nineteen leagues N. W. by W. from Sinamari is the River Maroni, which is very considerable. Its entrance is about 2 leagues wide, but is difficult of access, on account of the shoals of sand and clay which are in it. In this space of coast the rivers Sinamari, Aracoubo, and Amanibo, disembogue themselves, and shoals and banks of clay stretch out about 3 leagues to sea, along the whole of it; so that it is indispensably necessary to keep at least 4 leagues from the land, in 5 or 6 fathoms of water. It is also to be remarked, that between Cayenne and Maroni there are many single or detached rocks, some of which are even two leagues from the shore.

From the River Maroni to Surinam River, the distance is about 34 leagues. The coast trends W. by N.: it is all so much alike, and so low, that it is totally impossible to distinguish one part from another, so as to rectify the position of any vessel; hence it is absolutely necessary to make the Maroni, in order to be sure of falling in correctly with Surinam. This coast, also, has various banks of clay stretching from it, which render it necessary to keep at four leagues off it. The entrance of the River Surinam, when coming from the eastward, may be known by its Crow's-bill Point, which may be seen at 4 or 5 leagues off, and is the only land which, under these circumstances, can be discerned. It has a beacon on it, as before mentioned. The east shore is that which is first seen; the opposite cannot be discerned until you are in the entrance of the river, it being remarkably low land, which, as it were, hides itself to the west.

To anchor in the entrance it is necessary to bring the east point, of which we have spoken, to bear S. E. or S. E. by S., at the distance of three leagues, anchoring then in $3\frac{1}{2}$ fathoms at low water. The tides flow at six o'clock, on full and change days: and at the anchorage, at the entrance of the river, the flood tide sets from S. to S. S. E., and the ebb from N. to N. N. W. The least water is two fathoms and a half. When the wind is favorable for entering the river, steer S. E. or S. E. by E., until the east point bears east; then steer E. S. E. to anchor in 5 fathoms, on a clay bottom, at a quarter of a league from the east point, which is named Bram's Point, with that point bearing N. 9° W.

At one league up the River Surinam the River Comowinie discharges its waters into it. The entrance is defended by Fort Amsterdam, on the south side, and by a battery, which is on the north part, so situated as to defend the River Surinam also. On the west bank of the latter there are various batteries, which cross their fires with those of Fort Amsterdam. A little further up is the bar, upon which there are not more than two fathoms at low water. After passing this, you find, on the west shore, Fort Zeeland, and the town of Paramaribo, which is the capital of this colony.

Four leagues west of the River Surinam, the River Saramaca and Copename enter the sea by the same mouth. Their banks are uninhabited, and in their mouths are two fathoms at low water.

Ten leagues west from these rivers, the River Corentine disembogues itself. Its entrance is about a league in width, but of difficult access, on account of the sand banks off it, which extend three leagues out to sea. Within the river are three islands, which are very clean, running north and south; between you may anchor in 5 fathoms of water. The entrance and anchorage are on the west side. The small River Nikesa also discharges its waters by the same mouth as the Corentine.

Five leagues west from the Corentine is the River of Berbice. Its mouth is about a league in width. Its banks are very low, and covered with trees. In the very mouth lies Crab Island, which divides the entrance into two channels. This island is low and bushy, and is surrounded by a bank of sand and clay, which prevents a nearer approach to it than at least a long musket shot. It is in length about a mile, and half a mile in

breadth. The bank which surrounds it stretches about a league to the northward of it. A rocky shoal extends from its east point, to which it is necessary to give much attention, as you must enter by the east channel, on the bar of which there are not more than two fathoms at low water.

[Directions for the Demarara have already been fully given.]

The River Essequibo is very large. Its mouth is three miles wide, but it is full of islands and shoals, which obstruct the passage, and render it difficult to enter; and although the islands and shoals form channels deep enough for all classes of vessels, yet it requires much care and practical knowledge to enter them. The islands are numerous, low, and bushy. The greater part of them are a league or two leagues in length, but very narrow, and lie north and south. There are two principal channels for entering the river, viz., the east and west channels. The eastern is the best; there are in it from 15 to 35 fathoms. After having passed the islands at the entrance, you will see another cluster of them, which it is proper to pass on the east side, where they form so deep a channel that there are from 40 to 70 fathoms in it.

At 10 leagues from the entrance the fort is situated, upon an island in the middle of the river. The town, or rather village, is situated on the west side, in front of the fort.

At 15 or 16 leagues from the Essequibo, is the mouth of the River Pauroma, which is about half a league in width; its shores are low, and covered with trees. The east point of the entrance is named Cape Nassau. Six leagues up the river, on the eastern side, is the fort named New Zealand; the town or village, named Middleburgh, stands at the foot of the fort.

From the River Pauroma the coast trends, without varying its appearance, to Coco Point, which forms a bay to the south, and to the westward has some very high cocoanut trees, which are the only ones on all this coast, on which, in general, there is nothing else than mangroves.

From Coco Point you ought to steer N. W. and N. N. W., with the precaution of keeping in 5 or 6 fathoms of water, in order to shun a bank of mud, which lies about 2½ leagues N. N. W. from it. Having run 12 leagues on these courses, you will see the mouth of the Guayama, situate in 8° 25′ N. latitude. The making of this mouth is very necessary for those who seek the great entrance of the Oronoco, as there is no other point which can be used with certainty as a mark, and it cannot be mistaken; not only because it is the sole entrance or opening which can be seen, but also on account of three little hills, or hillocks, which may be seen, if the day be clear, bearing about S. W., at some distance inland.

N. E. from this mouth, about 3 leagues distant, there is a shoal of fine sand, with 2½ fathoms of water on it; and to avoid it, you must take good care not to shoalen the water more than to 5 fathoms, muddy bottom.

From the mouth of the Guayama the coast is woody, level, and low, and trends for 8 leagues about N. W. to the Point of Mocomoco; after which comes the coast named Sabaneta, which trends west about 4 leagues: it also is covered with wood, level, and lower, and the water on it shallower, than the former. All this coast is bounded by a shallow bank of soft clay and shells, and sand with clay and shells.

RIVER ORONOCO.—The Isle Congrejo (Crab Island) of which the N. E. point is in lat. 8° 51′ N., has a shoal of hard sand, of the color of ground coffee, which extends 6 leagues from its eastern part, and about 2 leagues from the northern part of the island; and this renders the entrance of the river dangerous: for between it and the coast of Sabaneta is formed the bar of the Grand Entrance of the River Oronoco, the depth of which, at low water, is 15 feet, and at high water, only 16 feet; the bottom soft clay. The bar is about 3 leagues in extent from N. to S., and a little less from E. to W.

The coast, which is rather higher than the former, though still woody, trends S. W. from Point Sabaneta, about 3 leagues, and ends at Cape Barma, which forms the boundary of this line of coast; as after this it forms a great bay, into which the river empties itself.

The coast which follows, from Isla de Congrejo to leeward, is very indistinct from the former; low and all broken, forming different mouths, by which the small branches of the Oronoco discharge their waters. They are fit for small vessels only, which have pilots, because they are full of dangerous sand banks.

GRAND MOUTH of the RIVER ORONOCO.—After what has been stated, we need only say that, having recognized the Boca de Guayama, you may run along the coast at the distance of 5 or 6 leagues, in 4 or 5 fathoms, in soft clayey bottom, until Cape Barma bears S. by W., when you may shape your course for the bar; still, however, keeping the lead going, in order to preserve the soft clayey bottom, although even in shallow water; as it is better to get ashore on the clayey mud, than to run the risk of falling on the shoal of hard sand off Isla Congrejo. If you catch that quality of soundings, (hard sand, like ground coffee,) you must immediately steer south, to recover the soft bottom. Following these directions, you will near Cape Barma; and when about 2 leagues from it, you will see a large island covered with trees, which is that called Isla de Congrejo; and having passed the bar, you will begin to augment the depth

of water until you find 5 fathoms. When it is proper to steer from S. W. by S. to S. W. by W. to keep mid-channel, understanding that, if you are in less than 5 fathoms, soft bottom, you are too much on the main land side of the channel, and must steer more to the westward to recover the mid-channel; but if you find less than 5 fathoms of water, with a sand bottom, you are getting upon the shoal off the Isla de Congrejo; and, in this case, must steer more to the southward to recover the mid-channel. With these directions, and attention to the soundings, you may run in, until the S. E. point of Isla de Congrejo covers some woody islets, which lie off the N. E. point of it; you may then run close to the island, and anchor in 5 or 6 fathoms of water, the bottom soft clayey mud. Moor with a cable ashore, and in this situation every vessel will be secure and well sheltered; and it is necessary at this place to wait for a pilot to conduct any vessel up the river; for without one they may be certain of experiencing some misfortune or other. A pilot may be engaged from any of the small vessels of the country.

On all this coast the tides are rapid and irregular. They are said to be felt as high up the river as Imataca, a village of the Guaraunas Indians. As to the times of high water, all that the pilots remark is, that at one-third ebb, at the rising of the moon, the water of the Oronoco increases from April to September, and decreases during the other months of the year. It is navigable for large vessels up to the capital only, between the months of May and December; during the rest of the year they must stop 16 leagues farther down, not being able to ascend higher, in consequence of a bar or pass, named del Mamo, which at that time has not more than 4 or 5 feet of water on it; and large merchant vessels, therefore, must employ lighters to load and unload them, which, although there are plenty of them, occasions much expense.

The magnetic variation, at the mouth of the river, is 4° E.

From this mouth the Delta of the River Oronoco extends itself to the interior of the Gulf of Paria, rendering this portion of the coast useless, either for trade or navigation, being no more than a labyrinth of low muddy isles, which are drowned in the season of the floods in the river. The number of them is unknown; and it is not easy to make a plan of them, for they are all formed by the various channels into which the Oronoco divides, and which may be considered as useless for any thing, except boats and canoes. The termination of this coast may thus be fixed at the Grand Mouth of the Oronoco, which we have described; and we now proceed to make some general remarks which follow:

GENERAL REMARKS ON THE COAST OF GUYANA.—Although the whole of this coast may have no great errors in the situation on the charts, yet it must not be supposed that every point of it is accurately placed: for instance, Point Barima had an error of 22 minutes of latitude in its position. The points which have been observed are inserted in the table of latitudes and longitudes.

The mariner may confide in the situation of these points; and it is necessary to remark, also, that on a coast of which there is scarcely a possibility of recognizing the different places, except by the latitudes, it is very easy to make a mistake, and get to leeward of your port of destination. For this reason it is proper to run down the coast from windward to leeward, taking good care to make the various places out distinctly. It is also proper to examine the mouths, or embouchures of the rivers; and what renders this more and more necessary is, that, in the season of the rains, there are often days on which the latitude cannot be observed.

2d. If such is the uncertainty as to the positions of the points, it is no less in respect of the soundings at the mouths or entrances of the rivers. It ought always to be remembered that all these rivers form bars, and that the bars generally have very little water on them. The best way for those who have not a practical knowledge of these entrances, is either to obtain such by means of their boats, or not to enter a river without a pilot.

3d. The wind, which from E. N. E. to N. E., or E. S. E. and S. E., always prevails upon this coast, and the current, which always runs W. N. W., make the lesser latitude to windward; and hence, on all this coast, it is very easy to increase your north latitude, but almost impossible to decrease it.

4th. The general current, of which we have spoken, must not be confounded with that which is produced by the tides, the influence of which is principally felt near the coast; and 12 leagues out at sea, or 9 fathoms of water, may be considered as their limits; as at that distance out at sea, no other current than the general one is felt: but between that and the land no other currents than those caused by the tides are felt. The flood sets towards the coast, and the ebb away from it: the tide flows, on full and change days, at Cape North, at 7 o'clock; on the coast of Mayez, at 6 o'clock; at Cayenne, at 5 o'clock; and at Surinam, at 6 o'clock.

5th. In addition to what has already been said, it is advisable for vessels bound from Europe to Guyana, to make the land about the coast of Mayez; shunning the vicinity of the River Amazon, because it produces vast swellings, which are felt a great distance out at sea; and which, near the mouth of the river, might prove most fatal to a vessel.

This phenomenon, which is known in the Ganges, and other great rivers, by the name of a bore, is here called the pororoca, as already noticed.

6th. Having made and recognized the coast, it is necessary to run along it, keeping the lead constantly going, so as to keep in 7, 8, or 9 fathoms, taking care not to get into less water, from fear of striking on some of the shoals which stretch out from the coast; and although with that depth, in some places, the land cannot be seen from the vessel, even in clear weather, this can occasion little or no inconvenience; as when near the latitude of your place of destination, it is easy to put the vessel on the larboard tack, and run in to sight the land. Nor is there any difficulty in examining it, when necessary, as you have only to keep more away on the larboard tack; but in such cases it is very necessary to be extremely careful with the lead. When night comes on, and you are near the port of your destination, it is proper to anchor; as also when it is calm, within the limits of the tides, (described before,) as the current, or set of the flood tide, carries a vessel towards the coast.

7th. Getting aground on this coast is not generally attended with much danger, as the bottom is always of clay, more or less soft. Notwithstanding this, no one ought to navigate this part without due care, as getting ashore not only causes loss of time, but occasions much work in carrying out anchors, &c., to get a vessel off. We notice here that, even when a vessel is in the regular track, although in 9 fathoms of water, she will raise the mud as if ploughing it with her keel. This may cause uneasiness to those who witness such a thing for the first time, though it is the consequence of a very natural cause.

8th. The islands of Remire, the Constables, and the Health Islands, are the only points of this coast which are likely to cause the loss of a vessel, if it gets ashore on them. In order to avoid this, it is needful to pay attention to the currents, that they do not drive you upon them; and not to attempt to pass between the Constables, unless with a free wind; with the contrary, it is better to anchor at three leagues from them, or to pass outside of them, taking care to give the shoal, of which we have already spoken, a sufficient berth.

9th. On the whole of this coast there are no other harbors than those formed by the mouths of rivers, the greater part of which require practical knowledge to enter them, on account of the bars and shallows which run out from all of them; but, as on all this coast, storms are unknown, and there is not the smallest risk in anchoring where one deems it to be necessary, there can be no necessity to run rashly for one of these anchorages, but rather wait at anchor outside for a pilot, or till such time as you can obtain a sufficient practical knowledge of the place by means of your boats, so as to be able to take the vessel in safety yourself.

10th. When any one wants to beat to windward on this coast, or, what is the same, wishes to go from the Oronoco or Surinam to Cayenne, he must work along the coast with the ebb tide, in from 3½ or 4 fathoms water, out to 8 or 9 fathoms: for though you may be shouldered away by the current to the N. E., you will gain very well on the tack to the S. E., or E. S. E., but with the flood it is necessary to anchor; for then, both wind and current being against you, you will irremediably be driven upon the coast.

11th. Those who from the Antillas are bound to any port in Guyana, ought to keep their larboard tacks on board, until in a convenient latitude to make the land to the southward of their port of destination, which ought to be more or less to the southward, according to the practice and knowledge of the navigator who directs the vessel; but, upon all this coast, especially from Cayenne to the Oronoco, even the most experienced are unable to ascertain the places where they find themselves; and without the assistance of observations for latitude, and of prudent conjectures on the different appearances to windward and leeward, they would often commit very serious mistakes.

The environs of Demarara are the parts of the coast easiest known, on account of the trees being burnt and cut down to clear the land for cultivation; and where these trees have been cleared away, there are clear spots, or gaps, in which, (as already stated,) houses, &c. may be plainly seen. When at a loss, it is best to anchor till you can clear up your doubts; as, although you lose the time in which you are at anchor, yet you keep still to windward, which is what interests you most; and which, if lost, it would cost you much time and labor to recover.

12th. DEAD RECKONING *in Shoal Water, as on the Coast of Guyana, &c.*—As the greatest uncertainty in the situation of a vessel arises from the errors in the dead reckoning, caused by currents, to diminish such errors, and render the computation more correct, it is advisable to take off the log-chip from the log-line, and to substitute a leaden weight, weighing 4, 6, or 8 pounds, as may be judged necessary; this, taking the bottom, (when the log is hove with it, in place of a log-chip,) will not so easily follow the vessel, or be influenced by currents. By this mode it is clear that the log will show the whole distance which the vessel runs, whether caused by winds or by currents. Then having made fast the log-line, before you haul it in, mark the bearing of it, and the opposite point or direction will be the course which the vessel makes good. It is clear that, by this mode, the course and distance ought to be as exactly found as if no

current existed. If you heave the log with a chip, in the usual manner, as well as a log with a lead attached to it, and compare the distance by it, and the course which the vessel appears to make by compass, with the distance and course found by the proposed method, you will be able to ascertain the direction and velocity of the current.

SOUTH AMERICA, SOUTH OF THE EQUATOR.

We now commence south of the Equator, with the Island of Fernando Noronha and the Roccas, as they are often fallen in with in the route to South America.

FERNANDO NORONHA.—This island is remarkable by a high rocky peak on its north side, called the Pyramid, very barren and rugged; and by its S. W. point, named the Hole-in-the-wall, which is pierced through, and gives a free passage to the sea. The Pyramid appears, at a distance, like a very high steeple, or tower. The south side is distinguishable by a little rocky isle, that appears like a statue. The island is about 7 miles long, and 2 or 2½ broad. It has been the rendezvous of vessels employed in the southern whale fishery, &c., for procuring supplies of cattle, sheep, poultry, wood, &c.; but water is frequently scarce. East India ships have also occasionally touched here, when they have been horsed to the westward by the currents.

On approaching the island, no soundings will be found until very close in. There is no danger but what may be seen, excepting a rocky spot off the south side, between two and three miles from the shore, and a rock at about a quarter of a mile from the S. W. point.

The road, or principal anchorage, is on the north side of the island, being sheltered by the north-eastern land, and several islets in that direction. The anchorage has from 10 to 12 fathoms, loose sandy ground, at about half a mile from the citadel point, or nearest shore. It is unsafe to lie in with northerly or N. W. winds, which are said to prevail from December to April; in the other months the winds are mostly from the S. E., or easterly; sometimes at N. E.

Fernando Noronha was formerly appropriated exclusively, by the Brazilian government, as a place of exile for their vilest criminals, under the control of a garrison. All the little sandy bays and anchorages are defended by forts.

Water may be obtained here; but in the dry season it is sometimes very scarce. In seasons of drought, which are not uncommon, the rivulets are dried up, and the vegetation parched. There are but few vegetables, but plenty of live stock and fish, with an immense quantity of doves. The fresh water is obtained from a well near the Governor's house, in the cove called Water Bay; but the cask must be rolled over some rocks and swung off to the boat over the impending surf.

Wood is cut on the larger islet to the N. E., called Wooding, or Rat Island. This islet is nearly surrounded by rocks, and there is risk of staving the boat when taking off the wood, as it is heavy, and sinks if thrown into the water. Should the governor permit wood to be cut on the main island, it may be conveyed without much danger from the fine sandy bays to the westward of the road.

In 1805, Captain Mortimer found but a small supply of water, few vegetables, but plenty of live stock and fish, and an immense quantity of doves. On the 9th day of April, 1827, H. M. ship Cambridge, Capt. J. T. Maling, touched here, and there were at that time about 200 inhabitants on the island: of these 60 were soldiers, under the government of a Prussian officer, who, with the assistance of an engineer, was repairing the fortifications and erecting new points of defence.

From Tobacco Point, or the south point of the island, a reef of rocks, even with the water, extends half a mile to the southward; and to the S. E. by E., 2½ miles from the same point, is the centre of a rocky patch, on which the sea always breaks. Within a line with these rocks the pyramid is shut in with the highest hill on the south side of the island. Between this reef and the shore is a channel of from 10 to 15 fathoms.

The current here commonly sets strongly to the westward, for which due allowance must be made in rounding the islands to the N. E.

THE ROCCAS.—These are dangerous low keys, 16, or 17 leagues to the westward of Fernando Noronha, and on which the Britannia East India ship and King George transport, deceived by the currents, were lost in 1805. The keys, or islets, are sandy, with shrubs upon them; they cannot be seen from the mast head in the clearest weather at the distance of more than 3 leagues. At their N. E. end is a high rock, and the sea breaks exceedingly high all round them. The ship Glory, at two miles to the west of the reef, found bottom at 28 fathoms, coral rock. The current here was found to set 2½ miles hourly, to the westward. Rise and fall of tide 6 feet.

COAST OF BRAZIL, *by Baron Rouissin.*—The appearance of the coast of Brazil

is very different. From the Island of Santa Catharina up to Olinda Point, (60 leagues north of Cape Frio,) the land is very high and woody, and can be discovered in fine weather from 50 to 60 miles distance, and consequently, with little care, a vessel can make land without danger. North of this, in many places, the land is very low, and not to be perceived from that distance; as, for example, between Espirito Santo and Mount Pascal; between the Bay of Porto Seguro and the bay of All Saints; between the Torre de Gracia de Avila and Cape St. Augustine; and finally, every where between Olinda and the Island of Maranham: in all these places the land is more or less low, few mountains can be perceived, being so far in the interior.

Sounding in general is of very little service to indicate the distance from the land, particularly from Point Santa Catharina Island up to Olinda, on account of the great depth even at a short distance from the shore, except in the neighborhood of the Abrolhos. It may be generally stated that the depth under the following parallels, is nearly this; 70 fathoms at 18 leagues distant from the land of Santa Catharina; 40 fathoms at 12 leagues from the Paranagua; 50 fathoms at 12 leagues east from the Island of San Sebastian; 35 fathoms at 5 leagues south-east of Joatinger Point; 77 fathoms at 18 leagues south-east of Rio Janeiro entrance: finally, more than 60 fathoms at 7 leagues only from Cape Frio. The depth of the sea is very great N. E. of Cape Frio, for at 30 leagues distant, in a direction E. $\frac{1}{4}$ S. of Cape St. Thomas, we did not find the bottom even with 100 fathoms. Soundings increase again E. and S. E. of Abrolhos; generally speaking, it is in a few instances not to be depended on, that a less depth than 100 fathoms is to be met at 30 leagues from the coast.

No bottom is to be met, even with 200 fathoms, eight leagues only S. E. of St. Salvador, nor at 12 miles south of this, although at a distance of 4 miles, there are but 20 fathoms; and finally, E. from Cape Morro San Palo, we did not find the bottom with 120 fathoms, although at 9 leagues distant. From Bahia to Olinda the coast is not less bold, for at 9 leagues east of Torre de Gracia de Avilla the sounding is over 180 fathoms; at the same distance 9 leagues east of the bar of Itapierucu it is over 200 fathoms; the soundings are over 190 fathoms 20 leagues from Rio Real, and 15 fathoms are found 10 leagues east of Rio San Francisco. Finally, every where up to Pernambuco, there are not less than 30 to 40 fathoms at 9 or 10 leagues distant from the shore, and between Olinda and Pernambuco, from 18 to 20 leagues distant from the shore, the bottom is not met over 120 fathoms. Though the sounding be less north of Olinda, yet it is too great at a small distance to be of service.

North of Cape San Roque, the land being more low, and extending into the sea, the soundings decrease gradually towards the shore.

From Monte Melancia up to the village of Amufadas, there are but 15 fathoms at 16 leagues distant, and farther north the soundings increase, but it may be taken as a general rule, that 10 fathoms are to be met with at the distance of 10 or 12 miles, between Amufadas and Jericacoara. Opposite the village of Caraca there is a spot where 24 to 25 feet only of water are to be met, over an extent of three leagues, but it is the only place up to Maranham.

The coast of Brazil offers this particular, viz., that there are two banks or shoals at no great distance from the shore, the first of which is not far distant from the land, and in many places rises over the level of the sea, and in some other places form the breakers or shallow waters. The other bank, farther distant from the shore, is not equally distant any where. It cannot be stated as forming shallow water, but it is a fact, that between this bank and the former, there is a deep channel separated from the main sea by this bank and the small islands of Figuera, Castillo, Guemado, los Alcatroces, los Abrolhos. Manuel Luis Shoal may be considered as the prominent point of this second bank.

The temperature of Brazil varies. In the southern latitudes the winter is pretty severe. Frost and snow are not uncommon at Rio Grande. The seasons may be divided into two, viz., the rainy season and dry season, the last of which is from September to February. The rainy season continues from March to September, but the only months in fact which may be considered as rainy, are May, June, and July.

On the Brazil coast the south monsoon is from March to September. The northern one from September to March. The prevalent winds, according to the saying of the natives, during the south monsoon, are from E. S. E. and S. S. E., and during the northern monsoon are from E. N. E. and N. N. E.; this may be the case at sea. I will not oppose this fact, having no reason for it; but I can assure, from my own observation, that at a short distance from the shore I did not find the monsoon so regular as it is supposed; in fact, the most prevalent wind at all times, is from the eastern part of the compass. The rabajos are very strong winds, blowing from the S. W. during the rainy season. They last three or four days with great force, not so great when it rains, but very heavy in dry weather. This begins at the change of the moon. The *grains* are squalls, and are met more frequently in the neighborhood of Abrolhos Islands, and called for this reason, Abrolhos squalls. They are more frequent in the months of May, June, July, and August, and in very rainy seasons they blow from E. S. E. They say

they arise from a white cloud of a round shape, and of a little appearance at first, and by and by increase to such a force as to be dreadful.

Land breezes are very regular on the whole extent of Brazil coast, but not equally regular and strong, but more so as you approach the equator. At Rio Janeiro they are not very regular, and very often not at all felt. The land breezes are more powerful in the northern monsoon, and in the southern monsoon, very often the land breeze has quite the same direction as the sea breeze, this part coming from the S. W.

It is a general rule, that the land breeze will be more powerful in proportion as the sea breeze is so. It may be stated, that a vessel can depart from Brazil any day it pleases.

Generally, the more you proceed south along the coast, the more you must expect to find the wind coming from the south and west, in the rainy season. In this time of the year, from Abagoados Patos up to Cape Frio, they blow with great violence from S. E. to S. W., and even N. W. In this case they turn into hurricanes, and are called pampeiros. In the River Plata they are very dangerous. If at sunset, foggy clouds, and the land appears more distinct at a small distance, it is an omen the wind will blow from the S., or S. W., and they will be powerful in general. They last in proportion as they are more heavy, and last longer if not so dreadful. When they turn into a hurricane, they will never last over twenty-four hours. When the wind hauls towards the east, you may expect fine clear weather. It is to the contrary when it nears towards the west: easterly winds bring clear weather; westerly winds bring fogs.

Nothing positive can be said respecting the regularity of the currents: they generally follow the direction of the wind, for there is no river of a sufficient magnitude on the whole extent of the Brazilian coast, capable of causing a current, according to numerous observations. The average running of the currents is at the rate of six-tenths of a mile an hour; in the monsoon time, never over that rate, and in many instances below it, even no current at all. It is only north of *Pernambuco, that the current can be considered as permanent, and capable of causing some errors in the day's work of a ship; and, even in this case, it is only when you go along the coast at no great distance, for if distant at sea, no current exists. From what has been said respecting winds and currents, we may infer that no impediment exists in navigating the Brazilian sea, from Santa Catharina to Olinda Point, and it is entirely useless to endeavor to make land more south than the place bound to, as formerly prescribed. If going to Olinda, or any other place more north, up to Maranham, it is better to keep east of the place bound to, in order to counteract the effects of the currents, which run generally W. N. W., as will be more particularly stated when describing the several harbors, and the manner to reach them.

Description of the Cape and Banks of St. Roque.

The Cape of St. Roque admits hardly any description, for nothing particular exists by which this cape may be distinguished from the sandy beach. The color of the sand is white, but in some places appears of a reddish tinge, owing to the reflection of the light, and by this reason is not a very certain guide. From place to place, bushes are to be seen on the top of the beach, and some trees can be discovered far in the interior, which is not the case in coming from the south. Cape St. Roque is not in fact the most extreme end of this great elbow of the South American land, for the direction of the shore remains nearly the same twenty miles farther, and it is only at Calcanar Point that it changes its course to N. N. W.

From St. Roque the land lowers more and more, and 8 miles distant it forms Cape Petetinga, which cape offers no more particulars than St. Roque, and the beach is of the same white sand.

The Portuguese cosmographer, Pimentel, admits that near Cape Petetinga there is a good watering place for ships, but we had no chance to ascertain that fact.

Near Cape Petetinga the soundings begin to indicate the shallow water of the Banks of St. Roque. This shoal runs in a direction parallel with the shore, nearly 60 miles, and the average breadth may be considered 6 miles. The channel between them and the main land is from 5 to 6 miles wide, and it is reported that vessels of a less draft of water than 7 or 8 feet, can pass without the least danger. The greatest distance from the northern shoal to St. Roque, is 20 miles.

Notwithstanding the small height of the shore near these shoals, in fine and clear weather, it may be discovered before you reach them.

The whole extent we ascribe to the shallow water is not equally dangerous, and it is reported that places exist where large ships may cross them. As the whole coast is of very little interest, one will do better to keep at a distance from it.

The eastern breaker stands 12 miles distant from Calcanar Point. The sea seldom breaks over it. The next west of the former, and 8 miles distant from dos tres Irmaos Point, is called the Lavandera, and the third one, called the Urcas, stand 12 miles N.

* A light-house, which exhibits a revolving light, has been erected at the entrance of Pernambuco, by which that part of the coast may be recognized.

¼ N. E., from Tubaroa Point, and opposite St. Alberto Bay. The sea breaks constantly with great force on these two last, particularly when the wind blows from the sea.

By keeping at a reasonable distance, there is not the least danger to be apprehended. We found the soundings increasing regularly and very fast, towards the sea, the surest proof that no more shallow water is to be met, though in many charts another shoal is marked E. 20° N. of this place. This we consider as an error, for the reasons previously stated.

The soundings are of no service to indicate the approach of this place. The nature of the bottom seems to be the same every where, and we found it always a mixture of white madrepores, intermixed with sand, and in some instances with gravel.

The green color of the water, like every shallow water, deserves more notice, and you may consider yourself safe as long as you have not reached this green water.

The current runs N. N. W. and N. W., at the rate of nearly 2 miles an hour; and the tide rises from 6 to 10 feet, according to the new or full moon.

From Cape St. Roque to Ponta Petetinga, is 5 leagues to the N. W. and N. W. by N. At the foot of this hill, or eminence, is a stream, where you may obtain water; and at about a musket shot from shore is a high reef, near which you may anchor in 3 or 4 fathoms; bottom of sand and mud. The coast, in general, is flat and barren.

At 3 leagues from Petetinga, westward, are some rocks on the shore called Pedra da Garca, near which any ship may anchor; and at about 15 leagues to the west, is the Ponta das Pedras, or Point of Rocks, with the rocks called the Three Brothers. Of all the coast between, the country is bare and black, its surface covered with sand, and it appears like small islands.

Off the Pta. das Pedras are three shoals of rock, having a channel between them and the main, of 3 and 4 fathoms. At 3 leagues outward are reefs above water.

Of the River Guamare to the S. W., the distinguishing marks are two inland sugar-loaf mountains, of unequal heights. To the west is the Island Tubarao; then follow the rivers Amargosa, Cavallos, and Conchas: of these rivers the first two lead to the Salines, or Salt Ponds of Assu; whence many parts of Brazil have been supplied. The coast hence trends to the Ponta do Mel, or Honey Point, as shown on the chart. The point may be known by its high red cliffs; and hereabout were, and probably still are, some palm or cocoa trees.

At the River Upanema, situate as shown on the chart, are natural salinas, which, like those of Assu, require no artificial means for crystallization. Its entrance has a bar of little more than one fathom at high water, although within there is a depth of 8 fathoms. Here the land is very level; and on the west of the river, there are, as far as a field-piece can carry, red cliffs. Within land is Monte Vermelhos, a sugar-loaf hill. Ships, however, should not advance into the bay, as it is full of shallows.

From the River Upanema to the N. W., the next river of any consequence is the Iaguaripe, which may be known by a round bare hill of sand on the N. W., terminating in a rock below, and within land a mountain, having seven sugar-loaf points.

Five leagues inland from the Iaguaripe rises the range of the Gumame Mountains, which extend ten leagues in the direction of east and west.

Commencing at about three leagues from the River Iaguaripe, the land for nearly four leagues, close to the sea, appears dark and full, with several openings like bays. At about half a league from the commencement of these openings are some white cliffs, in shape like a schooner, with all sails set, and head at east. So soon as this full land terminates, the coast assumes a more flat and level appearance.

Upon the south bank of the River Iaguaripe, at the distance of about nine miles from the entrance, is the town of Aracati. At the entrance is a bar, narrow and dangerous, owing to sand banks on each side; and upon these the surf is very violent. The sand is so loose at the mouth of the river, that, even with the coasting vessels of the country, every precaution is required. The river widens immediately within the bar, and forms rather a spacious bay; but the port cannot, from the uncertainty of its depth, ever become important, and it has, at times, been nearly choked up.*

Pimentel describes the Bay of Iaguaripe to the south-eastward of Seara, which, he says, forms a small harbor to the westward of some low level land. The bay is surrounded by very high perpendicular cliffs, against which the sea breaks at half tide. It has a high round rock, behind or within which is shelter and anchorage in two and a half or three fathoms. On the N. W. of this bluff rock you may anchor in the very roll of the sea, as it has 4 and 5 fathoms; and on the strand are pits for watering. Alongside of the rock of Iaguaripe, on the east, the River Xaro falls into the sea: and, on its west side, three leagues out to sea, is a shallow of green water, of 5 to 7 fathoms, with bottom of mixt sand, and, in some places, small shells.

SEARA is the most important town upon this part of the coast. The bay on which it stands is formed by Point Macoripe, (in lat. 3° 40′ 30″ S., and long. 38° 27′ W.,) to the

* Koster's Travels in Brazil, vol. 1, p. 175.

eastward, and by the River Papina to the westward, an extent of about 4 leagues. It is extremely open; its greatest depth being 3 miles.

Abreast of the town, and at the distance of half a mile from the shore, extends a ridge of rocks, level with the water's edge, and within which small craft generally anchor, the entrance to the anchorage being around the eastern end of the reef.

The land within Point Macoripe is a high and irregular sand hill, terminating in the point, which has a tower near the extremity. Ships advancing from the N. E. should not approach the point nearer than three miles, and should choose a berth without the points which form the bay. Tolerable anchorage may be obtained by bringing the point to bear S. E. by E., and the town of Seara S., about 4 miles distant from shore, in 5 fathoms, sand and mud. His Majesty's ship Inconstant, in 1814, was the first English ship of war that had anchored here within the memory of the oldest inhabitants; having brought up in a spot which had previously been occupied by the American frigate Constitution.

The Recife, or Reef, forms a complete ridge, at a considerable distance from the shore, and is to be seen at low water. It extends parallel with the shore for about one-quarter of a mile, with two openings, one above and the other below the town. A small vessel may come to anchor between it and the shore; but a ship can bring up only in one of the openings of the ridge, or on the outside of it. A vessel coming in from the northward should make Point Macoripe, which is a league to the eastward of the town, with a small fort on it, and may thence bring up in 6 or 5 fathoms. On the appearance of a ship, the town fort displays a white flag upon a tall flag-staff.

North-eastward of Seara, between the reef and shore, is a rock, called Pedra da Velha, or the Old Woman's Rock, which may be known by the breakers over it. When a vessel leaves the port she may pass between this rock and the shore, giving berth to a shoal which lies about 100 yards to the northward, or she may run out between the rock and the principal ridge, or reef.

On the 1st of January, 1824, a vessel, commanded by Mr. J. W. Matthewson, was wrecked by striking on the Pedra da Velha, while lying to for a pilot. The rock appeared to be in size not more than two or three times the length of the ship. It lies about one-third of the way between Point Macoripe and the inner anchorage, and the depth all round it is 3½ fathoms.

Captain Matthewson says, "In going into the bay, I kept the lead constantly going; and when in 3½ fathoms wore ship, with her head off shore; at the moment before she struck we had this depth of water. She struck only twice, did not stop, and, as quick as the lead could be hove, we had 3½ fathoms again. The vessel drew scarcely nine feet of water.

The breach may be seen on the rock at low water; but in the day-time, when the sea breeze sets in, the water generally tops and shows so much alike that it is not easy to distinguish the place of the rock in the general swell.

The inner anchorage, above mentioned, is between the recife, or reef, and the shore. You enter by the eastern channel and go out by the western, when you cannot fetch out by the eastern one. Here a vessel lies at low water, surrounded by breakers, except in the channels; and, as the pilots are very inattentive, it is, altogether, very dangerous. This is, nevertheless, becoming a place of very considerable trade.

"From Seara the coast trends N. W. by W., to Jericoacoara,* the depth gradually increasing off shore; but a N. W. course should be pursued, to avoid a spit, the base of which extends from Mount Melancias to Jericoacoara, and terminates in a N. E. direction from the latter, at the distance of 6 or 7 leagues off shore. Having run 100 miles upon the above N. W. course, including a mile and a half per hour for the current's assistance, in soundings varying from 11 to 20 fathoms, change the course to W. ½ N., which is nearly the direction of the coast from Jericoacoara to Mangues Point, and it will give you a sight of the land as far as the Island of St. Anna.

"When ships are bound to Maranham, from seaward, it is absolutely necessary to make the land considerably to the eastward, as the currents, in general, set very strongly between W. ½ S. and W. N. W. If, in endeavoring to make the land, you should be in lat. about 3° S., on discovering it you will be off Mount Melancias, or between it and Seara; if the latter, three other mountains will be observed to the S. S. E., lying nearly S. E. and N. W. of each other, which mountains are about 7 leagues to the westward of Seara, and are easily seen from that place. About this part of the coast you will have a bottom of fine sand and shells.

"If you should make land when you consider yourself in from lat. 2° 15′ S. to 2° 30′ S., and have a bottom of small red and white stones, you will be off Jericoacoara; if the

* "Jericoacoara is a bay covered with sea weed, and its coast bare and barren. It is full of shallows, having near the shore only 2 fathoms. Its distinguishing mark is a fine high mountain, almost round, a little inland, the ground breaking near it, and forming others not quite so high."—[Pimentel.]

bottom consists of yellow, blue, and red stones, you will be off Parnahiba or Tamonia; and three mountains, lying nearly in the meridian of each other, in the neighborhood of the latter, will be seen.

"The whole coast, from Point Macoripe to Parnahiba, is sandy to about half a league inland, whence it appears well cultivated; so that it is easily distinguishable from the coast between Parnahiba and Green Mangues, (Mangroves) Point, which consists of nothing but sand, without the least sign of vegetation."

That part of the sea coast of the province of Paiuhy, extending from the Barra de Iguarrassu, the easternmost branch of the Rio de Parnahiba to the Barra de Tutoia, is incorrectly laid down in all our charts. The distance between these two mouths is about 36 miles, in which extent the Rio de Parnahiba discharges itself by four others. Two of the mouths of this river, namely, those of Iguarrassu and the Barra Velha, are only laid down in the charts, while the position of the four others is unknown. *Now this harbor of Tutoia is the only one along this extensive line of coast from Bahia de Todos os Santos to the River Amazons, that admits of the bar being crossed at all times of the moon, by vessels drawing* 14 *or* 15 *feet water.* Notwithstanding this, the position of the harbor of Tutoia is not only incorrectly laid down in some charts, but in many which are tolerably correct in other respects, Tutoia is not even mentioned.

The bar of Tutoia is between 7 and 8 miles wide. The masters of two English vessels, who sounded on it, never found less than 5 or 6 fathoms water, which corroborated the extract of a log of a large Brazilian brig of war that had entered the harbor a short time previous to our arrival.

The bars of Iguarrassu and Barra Velha are not navigable. Tutoia, as above mentioned, is the only port accessible, and is highly important in a commercial point of view.

"Inclining to the shore and observing the sand banks well, as you pass along, the entrance of the River Perguicas will easily be distinguished. The sand will now begin to assume a higher and more irregular appearance: this height and irregularity does not, however, deserve the appellation of hills. When the Perguicas bears S. S. E. you will begin to shoalen your water to 8 or 9 fathoms, but a steady course should be pursued, as you will presently pass the spit formed by the sand washed from the river, and which, meeting the natural course of the current in the offing, inclines it to the N. W.

"If the day should be far advanced when you are off this part of the coast, haul to the wind under topsails and foresails for the night; standing off into 22 or 24 fathoms, and on into 12 or 14. It would not be advisable to haul the wind before you are past the Perguicas, as, otherwise, you may be short of daylight for the operations of the ensuing day. At daylight you may bear up under all sail, pursuing the former course and distance from the shore, and towards the conclusion of the sand banks the land will begin to appear a little more fertile, and Green Mangues Point will easily be distinguished."

ANGERSTEIN'S ROCKS.—Lat 4° 28′ S., long. 37° 6′ W., soundings 11 feet.

Extract of a letter from Mr. John Bouch, master of the brig Angerstein, dated Rio Jaguaribe, 15th December, 1830.

"In lat 4° 28′ S., and long 37° 6′ W., I came through a cluster of rocks, thirteen in number, from two to three fathoms under water. I ran close along side of one; it was quite visible under water, and I hove the lead on it myself, and had not more than 11 feet water. They are not dangerous by day, but I should not like to be among them by night, with a sea on. The rocks being of a dark brown color, they show themselves sufficiently for a vessel to pass clear of them; and before the second cast of the lead can be got, you are in 10 fathoms water. They lie in a triangular form, about 11 miles from the land, with Ponto do Mel S. S. E. ½ E., the Red Mount on the Return W. by N. ½ N., 7 or 8 leagues."

Description of St. Marco Bay.

St. Marco Bay is that part of the sea comprised between the western coast of Maranham and the main land; its entrance lies N. N. E. and S. S. W.; its length is over seventy-two miles, and its width six miles; every where the depth of water is sufficient for large vessels, even frigates, which may cast anchor near the harbor of St. Luis, situated on the western coast of the Island of Maranham.

The prevalent winds being from the east, vessels bound to Maranham must endeavor to make the first land east of the island, except in case of a fair and favorable wind from north to west.

The white sandy beach, called Lancoe Grandes, is the first land a vessel bound to Maranham must endeavor to make: but it is proper to observe, that, by an error in the day's work, you may be deceived, and mistake the Lancoe Pequenas for the Lancoe Grandes, and in such case consider yourself west of the Perguicus, when in fact you will be on the east of this shallow water: to prevent such an error, the surest way will be to keep at 10 or 12 miles distant from the shore, with from 6 to 10 fathoms water, and sail along the coast until you reach the green mangle shore; from this point you must steer west; and very soon after you will discover the breakers of St. Ann Island, and the

island itself. Now you must direct your course round the breakers of St. Ann at 2 or 3 miles distance, until north of them, and you will be certain to have passed them when St. Ann Island shall stand south a few degrees east of you.

Having passed the northern breakers of St. Ann, you must steer again west, a few degrees north, until you discover the breakers of Corao Grande, which you may approach as near as the former. From this point you may proceed to the harbor by two different courses: if you intend to follow the first course, then you must steer round Corao Grande, keeping at a regular distance, with 10 or 12 fathoms of water: if the second, you coast along the western shore of Maranham Island. Maranham Island is easily distinguished from Santa Anna Island by its greater height, and its white shore towards the north.

The first point to be discovered, when keeping close to the Maranham Island, is Cape St. Marcos, from which the bay derives its name. It is a high land of very great declivity, on the top of which a house is to be discovered, with a mast for a signal. This cape and land project into the sea, and 800 yards from the sea shore there are many rocks and sandy breakers, which you must not approach, being very dangerous.

Keeping always the same course, S. W. and S. W. ¼ S., you will very soon reach the parallel of the small fort of San Antoni de la Barra, situated at the point of Areias, which forms the northern point of St. Luis Harbor. That point being part of the rocks and sandy bank above stated, it will be dangerous to approach too near, as long as you stand west of it, but when you shall have sailed beyond this cape you may cast anchor.

SHOAL OF MANOEL LUIZ.—At the distance of 77 miles N. 8° E. from Itacolomi, you will find one of the most dangerous shoals that you can possibly meet with at sea: this is called the Shoal of Manoel Luiz, and was only known by the number of wrecks that happened before we were able to discover or assign its true position. It consists of many groups of conical rocks, nearly even with the water's edge, separated by intervals, irregular both in distance and in depth.

This shoal, being situated in a sea rarely exposed to violent winds, breaks only for an instant, and that when the tide is quite low, so that it is almost impossible to perceive it even when passing very near. Nevertheless, the rocks on the surface which we have explored, are not more than from 5 to 15 feet under water at low tide, while there are 8, 12, and 10 fathoms close to them; thus you may encounter this danger suddenly, and be wrecked without the hope of assistance.*

The instantaneous breakings rise in appearance like the back of a whale, when the sea is calm; and when these disappear, they leave masses of white foam, which are visible for some time. When the sky is clear you may discover the rocks under water, which appear in large black patches: but as these patches are not perceptible until you are too near, you must not wait for such indications. After two hours of flood, and at the distance of only half a mile, it is probable you will not see one trace of this danger, if the sea is calm.

The survey which we made of this shoal has enabled us to be well acquainted with its approaches from the east, the south, and from the west, so as to be certain that nothing dangerous exists in these directions. I wish I could state the same with confidence respecting the approach from the north; but this examination would have occupied me eight days more, and we had not the opportunity of making it; for the following day, after we had discovered this shoal, the bad season set in with violence. The weather would not allow us to make any more astronomical observations.

All the accounts that I could collect of these rocks of Manoel Luiz agreed, in the midst of contradictions, in placing them more *to the southward* of the place which I discovered them in, and confined them to much narrower limits than those in which I found them; it was therefore most probable that I had seen them all. Nevertheless, I do not affirm this; and our survey having included the approaches to these dangers in the directions the most important to vessels which frequent Maranham, I am pleased to have resolved the question of the actual position of this danger in its most essential parts, agreeably to the instructions given me; leaving to a more favorable opportunity the chance of discovering whatever may be further interesting for the benefit of navigation in general. From our observations, made at the anchorage, 400 toises to the south of the most westerly rock of Manoel Luiz, and under circumstances which assure us of its correctness, I place these rocks in latitude 0° 51′ 25″ S., longitude 44° 14′ 45″ W., and the variation observed at the same anchorage, Jan. 29, 1820, was 0° 57′ E. The same day, in the evening of which it was full moon, we found the rise of the tide was 12 feet, and that it was high water at 5 o'clock; that the flood ran for six hours at the rate of six-tenths of a mile per hour to the S. W., and the ebb ran N. E. for the same period, and with the same velocity. Lastly, the nature of the rocks which form this danger appears to be of the same kind as those of the Abrolhos, and are similar to most of the

* The Venus, of Liverpool, in 1814, experienced this misfortune; for having struck upon this fatal rock, she went down immediately, and entirely disappeared in 10 or 12 minutes.

other rocks and islets at a little distance from the coast of Brazil, which we have already described.

Such were our observations, according to our surveys, of these shoals of Manoel Luiz, when, in 1825, we were told that another group of rocks had been discovered nearly 7 leagues more to the northward, and almost on the same meridian as ours. This discovery, entirely accidental, was made by Mr. Da Silva, an officer in the Brazilian Navy, who, on his route to Para, saw the breakers on his passage, and discovered these rocks. I am not acquainted with the particulars of this discovery; but the position given to this new danger is said to be latitude 0° 32′ S., longitude 44° 17′ 21″ W., and according to the account we received, there does not appear to be any doubt at least of their latitude.

One question here presents itself, that is, to which of the two shoals, Mr. Da Silva's or mine, ought we to give the name of Manoel Luiz? If you consult former charts which notice this shoal, you will find so little agreement among them, that it will be impossible to decide in favor of one or the other. They are marked as only one group of rocks, and not any of them are placed in the position given either by Mr. Da Silva or myself. I am therefore inclined to think that these two dangers ought to be considered as a continuation of the same shoal. Its extent, which would be 7 leagues north and south, having occasioned its being met with in many parts, will explain, in some measure, the different positions that have been assigned to it. I agree that this hypothesis would not justify all these accounts, because I am informed that the popular opinion at Maranham, for example, places the shoal one degree more to the southward than where we found it, and where *we are confident* there exists no sort of danger; and we may say the same respecting the danger discovered by Mr. Da Silva; however, it appears, beyond all doubt, that what is called the Shoal of Manoel Luiz, is only one of the points of the extensive shoal that Mr. Da Silva and myself have fixed the northern and southern limits of.*

We conclude this subject by observing, that it appears to us difficult to determine from the soundings, your distance from the Shoal of Manoel Luiz; the depth and the nature of the ground being so variable, at a certain distance from the danger, that you can deduce from them only very uncertain conclusions. The soundings of white sand, speckled black and red, as before mentioned, being the most common in that part of the sea, between the meridian of the Coroa Grande and that of the eastern coast of the adjacent continent, extend 10 or 15 leagues to the northward of the entrance of the Bay of St. Marcos; but these are not without exceptions, as you will often find soundings of a very different appearance.

Beyond this limit, as well as to the eastward of Coroa Grande, sand and broken madrepora are the most commonly met with. These are nearly the same which you so constantly meet with all along the coast of Brazil from the Abrolhos. We found them at the extremity of all our routes to the eastward, and on the parallel of this shoal; and it is probable they extend much farther to the northward and eastward.

In fact, broken madrepora are most common in the vicinity of this danger, to the east, south, and west of it; but they are mixed sometimes, though rarely, with coarse gravel, broken shells and rocks, but varying in depth so much, that you cannot, by the soundings, determine your distance from the shoal to within 5 or 6 leagues.

Directions for Vessels bound to Maranham, by Lieut. E. Stopford, commanding H. M. schooner Pickle.

Vessels bound to Maranham may cross the equator in longitude 40° W., which will enable them to fetch the Lancoes Grandes, a landfall deservedly recommended by Baron Roussin. It has been customary to make the light-house on the Island of Santa Anna, but an error in the longitude will be of less importance by making the Lancoes Grandes.

A vessel arriving off Santa Anna, and not having sufficient day-light to find her way into the Bay of St. Mark, may lay to for the night off and on the light-house, keeping it as near south of her as possible, distant 6 and 7 miles. The light is revolving, and can be seen distant about 15 miles.

As there is constantly a heavy swell on the coast, anchorage should be avoided if possible, as it is both difficult and dangerous to recover the anchor.

From Santa Anna a vessel should steer W. ½ N., by doing which she will pass the breakers off Coroa Grande, at the distance of about 3 miles, and Mount Itacolomi will be discovered bearing about west. When distant about 10 or 11 miles from the mount, alter course to S. ½ W., till the fort and flag-staff of St. Mark's are made out nearly

* It is remarkable that Captain Appleton, in 1817, discovered a dangerous shoal in latitude 0° 45′ S., and about 4 leagues to the westward of the reputed situation of the Bank of Manoel Luiz, which would appear to be placed somewhere between Roussin and Da Silva's Rocks, and probably will prove to be a continuation of the same dangers. He states them to be composed of sharp pointed coral rocks, with only 14 and 15 feet water over them in some places, while close to these shallows the lead will fall into 40 fathoms; this description, in its principal features, very much resembles that of the Baron.

ahead. St. Mark's point should not be passed at a greater distance than a mile and a half, that the bank of De Cerca (on the starboard hand going in) may be avoided: a reef of rocks runs off from the point; and to avoid these, it should not be approached within three-quarters of a mile. Within these limits a vessel may coast along until Fort Antonio bears E., or E. by S., when she should anchor and wait for a pilot.

A vessel, by following the above route to Maranham, will avoid getting entangled among the swash-ways on the Coroa Grande Shoals, mentioned by Captain Courtenay as being so very dangerous to strangers.

The inhabitants of Maranham, in consequence of their harbor filling up, expect to be obliged to transfer their port of shipment to Alcantra. Lieut. Stopford visited this port, and is of opinion that it is preferable in every respect to Maranham, being easier of access, capable of containing more ships, and allowing them to get in or out, at any time of tide, with the prevailing winds. The depth of water is also greater. The Pickle was anchored about one-third of a cable's length from the shore, in 7 fathoms at low water, being more than in any part of the harbor of Maranham, even at high water.

Captain Courtenay represents the bottom along the whole line of coast as being composed of quicksands, to which he attributes the frequent loss of anchors by vessels. Lieutenant Stopford is of a different opinion, having frequently anchored on all parts of the coast between Maranham and Para. It is, however, indispensable, that vessels should ascertain the quality of the bottom before anchoring, as it is foul in many places. The Pickle lost her small bower, before Lieutenant Stopford was aware of this, by anchoring on rocky ground. Vessels should be careful not to anchor off St. Mark's Point, as the ground is foul, and many anchors have been lost there.

ROUTE FROM MARANHAM TO PARA.—A vessel bound from Maranham to Para, during the rainy season, should get to the northward of the equator as soon as possible. She will thus avoid the light baffling winds and calms which prevail in this season: and also the current, which sets from E. N. E. to S. E. about 2 or 3 miles per hour, occasioned by the waters from the various rivers and bays of the coast.

To the westward of the Island of Salina there are some white cliffs so nearly resembling those to the eastward of that island, that they have been frequently mistaken for each other. Vessels mistaking the western cliffs for those east of Salinas, have stood on until they have become lost on the Braganza shoal, or in that equally dangerous place called the Well. The utmost caution therefore is necessary to attend to the following directions for anchoring at Salina.

Bring the town of Salina to bear S. by E. and anchor in 9 fathoms. The whole coast from Turnivissa is woody, and the white sand hills are very remarkable.

Information obtained from Senhor Saramanhas, the chief pilot, Lieutenant Page, commander of the U. S. Schooner Boxer, at Para, South America.

1. A flag hoisted on the flag-staff at Salina's village, is the day signal that a pilot may be obtained.

2. If the pilot should not, however, come off during the day, and at night there be shown two lights, the pilot may be expected off the following morning.

3. If there be three lights shown, the pilot has no boat, and must have one from the vessel to bring him off; in which case the vessel must bring the village of Salinas to bear S. S. W., in soundings of five or six fathoms water, when point Atalaia, (improperly called in the charts, Atasia,) will be distant about 5 miles. You may here dispatch a boat, well manned, which must be kept close in with the shore at Atalaia, clear of the surf, until it meets with an opening in the reef which lines the coast in front of the village, through which it must pass. Inside the reef, the water is quite smooth, and you may land any where upon the beach.

4. The boat should be sent at half flood, in order that it may return the same tide. It is high water on full and change at 7 o'clock, and off shore at 8. Para, June 1, 1832.

H. M. S. Pickel remained at anchor one night in 7 fathoms, with the town bearing S. by E., and had no difficulty in regaining her anchor in the morning. Lieutenant Stopford observes, that accidents have frequently happened, and lives have been lost by boats going for the pilots being swamped in the surf. They have frequently landed immediately under the town, which is very wrong, and Lieutenant Stopford recommends them to pass to the westward of the island: by doing this a river will be observed, which leads up to the town, where boats may land in safety, and thereby avoid the surf outside.

MARANHAM TO PARA.—Para, or Grand Para, is the northernmost province of Brazil, and is celebrated for its cotton, sugar, vanilla, chocolate, and coffee. The coast from the bay of Maranham to Para, is generally low and sandy, and has many little isles, of the same description, with numerous coves and rivulets. Pimentel has described the the whole, but his description is not adapted to the use of the modern navigator, unused to creep along the shore. Some of it may, however, be useful. A vessel, he says, bound from Maranham to Para, should take her departure in the morning, advance to the anchorage off the Aracaji, or cliff, already described, thence stand out to sea, beyond the shoals of Cuma, (or Carnaveros banks,) which may be effected in a run of 8 leagues.

Having passed these, you approach the sand bank stretching from the western shore, and over which there are 6, 10, 7, 6, 5, 7, and 8 fathoms. Thus you may proceed to the N. N. W., or N. W. by N., to the distance of 22 leagues, when the ground of the bank, white sand with black specks, will be succeeded by coarse sand and stones, or brown sand and broken shells, with 13 to 17 and 20 fathoms water.* Here you will be off the Island of St. Joao, or St. John, and near the parallel of one degree south.

The Island of St. Joao is nearly level with the sea, and about 3 leagues long from E. N. E. to W. S. W. Between the N. E. end of this island and Point Turivazo to the W. N. W., the distance is about 9 leagues. The bay between affords shelter, and vessels may anchor to the N. W. side of St. John's Island, in from 6 to 4 fathoms, sandy ground.

At the distance of 18 leagues W. N. W. from Turivazo Point is Cape Curupi, over which is a mountain, insulated and therefore remarkable. This mount is several leagues inland, and near it is another, somewhat smaller and rounder. The coast here, as in other parts, is, however, low, level and sandy, covered with a dark brushwood, and from the point a shoal, with breakers, extends 3 miles out to sea.

From Cape Gurupi to the River Cayte, on the western bank of which is a small town of the same name, the distance is 24 leagues, on a course nearly west. At the entrance of this river, on the eastern side, are several low islets, of the same name. Off the shore, throughout this extent, the bottom is generally flat, and there is commonly 7 and 8 fathoms at 3 leagues off, with clear ground.

From the Cayte to the inlet of Maracuno, the distance W. by N. is 12½ leagues. In sailing along it is proper to keep 2 or 3 leagues off shore, in soundings of 7 and 8 fathoms. The coast here is distinguished by a range or chain of white sand-hills, the highest of which, Piraussu Hill, is about 3½ leagues westward of Cayte Point, the western point of the mouth of the Cayte. Piraussu Hill appears like a high bluff, and perpendicular point, close to the sea, with red cliffs on its eastern side.

At 5½ leagues W. by N. from Piraussu Hill is Point Atalaia, distinguished by a watch-tower, having a gun which is occasionally fired when a vessel is approaching. On making this, and keeping a good lookout, the smoke may be seen. At this place are two eminences of white sand, and immediately west of the point is the inlet, or bay of Maracuno, having 5 and 6 fathoms of water, and good ground.

RIO PARA.—Point Tigioca, the eastern point of the mouth of the Para, is 9 leagues west from Atalaia Point; and within this, at the distance of 7 miles to the S. W., is Point Tapua. Here an extensive bank extends 2 leagues from shore between the two points, and to the northward are the Tigioca shoals and breakers, the positions and nature of which can be understood only by reference to the charts. The passage in is between these shoals, and has a depth of 12, 11, and 15 fathoms, at about 11 miles from the southern shore, in latitude 0° 23′ S. There is, also, a channel for small vessels, at 5 miles from shore, and along the edge of the Baxo do Boronoco, the bank which extends from Point Tigioca, as already noticed.

DIRECTIONS FOR PARA.—Vessels bound to Para should endeavor to make the land about Salina or Cayte, which lies to the eastward of Salina, and is remarkable for its white sand hills. Steering to the westward, keeping the land in sight 6 or 7 miles distant, you will make the Point Atalaia, which has a house near its extreme point, and immediately after will see the village of Salinas, which faces the sea, and easily perceived in clear weather by its white buildings. Here vessels take a pilot for Para, and if one should not come off by making a signal, you will have to send the boat on shore for one.

Should you not see Salinas, or find any difficulty in procuring a pilot, by attending to the following directions you will find no difficulty in passing the shoals, or getting up the river.

The land between Salinas and Tigioca runs about W. by N., about 4 leagues. To the westward of Salinas you will see a point of land, S. W. of which are two remarkable white sand hills, and by keeping a good lookout at the mast head, you cannot pass them without seeing them, they being the only thing remarkable between Salinas and Tigioca, and is a good departure to run between the shoals. Tigioca lies about 17 miles to the westward of this land, and is a low point. You will have, running along, 11, 12, 14, and 15 fathoms water, channel-way, and be careful in sounding; come no nearer the land than 9 or 10 miles, as you approach Tigioca, for fear of getting into the Well, which is a dangerous place, and oftentimes deceives strangers by supposing it to be a good channel inside, as most of the books and charts represent, but should never be attempted by any. The Well (or entrance of do.) is about 5 or 6 miles to the north and eastward of Point Tigioca, and has from 20 to 28 fathoms water: by getting that soundings you may judge immediately you are in the Well, for there are no such soundings any where about that part of the coast. Haul off as soon as possible to the south and east, to avoid the Braganca Bank, for in that soundings you are not far off danger; perhaps the next soundings you may not have more than 2 or 3 fathoms, and less, as I have found it to

* According to a late survey.

be the case in going through that channel with a boat, and sounded all the way, sometimes not 6 feet, and breakers both sides. I have been the more exact in pointing out the danger of this channel, that it may never be attempted by any, and if unfortunately you should happen to get in, and your water shoalens, if flood tide, come to anchor and wait for the ebb, and then you should not haul off the land too sudden, for fear of the Braganca Bank, which is inside of you, and which you cannot avoid seeing, as it breaks constantly unless at high water, and the sea perfectly smooth, which seldom happens to be the case, that a vessel can pass it without seeing.

Running for the Channel between Tigioca and Braganca Banks.

When you make Tigioca Point from the mast head, and running along the land so that you can see it plain from the deck, (say 9 or 10 miles,) you will soon discover the Braganca breakers from aloft, which break very high on the larboard hand going in, and is the best mark to run in by. The tide runs very rapid in this channel, and the sea at times, and for the most considerable. The ripple caused by the tide at times appears to a stranger like shoal water, where there are probably from 14 to 15 fathoms water, and while the Braganca is in sight, you need not be apprehensive of any danger, for the bank is steep close to the breakers, and you should pass within 2 miles of them, or even less, and when Tigioca Point bears about S. E by S., Braganca distant about 2 or 3 miles, you may haul up about S. W., to avoid Tigioca Shoal, which lies outside of you, and stretches to the south and west, and breaks heavy at the east part, but seldom seen going through this channel; and should your water shoalen, approaching said shoal, (which will not be the case whilst the land is in sight plain from the deck,) haul more to the south, and your water will deepen immediately; you may then proceed up the river by keeping the Braganca in sight, which will always be a sure guide for going in, keeping them at a distance of about 2 miles, more or less, as the courses given may be affected more or less by the tides.

The land between Tigioca and Point Taiper, is broken, appearing in spots of small islands, which makes them more remarkable, and near to Taiper is a dry sand bank, about 5 miles from the land, and to the south of which, abreast of Point Taiper, is good anchorage, in about 7 or 8 fathoms water, and is where pilots come to anchor, outward bound, to wait an opportunity of running out between the shoals, on account of being less exposed to the heavy sea which sets in with the flood tide, and out of the strength of it.

Point Taiper is about 11 miles from Tigioca Point. The land between Taiper and Vigia lies about S. W. by W. and N. E. by E., distant about 17 miles, between which, keeping at a distance from 5 to 4 miles, you will have 9 to 10 fathoms water; and as you approach Vigia, your water will shoalen gradually to 8 and 7 fathoms. The point of Vigia is remarkable in coming from the northward, and as you draw to the southward, another point will open, which shows the entrance of Vigia. Be careful not to approach too near Vigia, as there is a shoal stretches off about N. W. by N., 2 miles from the northern part of the land, which forms the entrance; and north from the southern part, which forms the entrance to Vigia, 2½ or nearly 3 miles, hard sand. Vigia is a small fishing town, and cannot be seen in passing, as there is an island in front of it, which stands some distance from the entrance.

Running along the land, at the distance of 4 miles, you will have 7, 8, and 9 fathoms towards Colares, it being a small village which faces the water, and is very easily distinguished by its white buildings, distant from the south point of the land 6 or 7 miles. Off this village, or between it and Vigia, is good anchorage about 3 miles from the land, sticky bottom. Be careful not to come too close to Colares, as there is a reef of rocks that stretches off nearly 2 miles.

If night is coming on, it is advisable not to pass Colares, but come to an anchor and wait until morning, and to know when you pass Colares, your water will deepen very soon after as you approach the Bay de Sal, which will be open to your view. Bay de Sal is a large deep bay, being about 4 or 5 miles wide at the entrance.

Be careful not get into this bay, as it is dangerous, being full of rocks, and no safe anchorage, and has sometimes been taken for Bay St. Anthony. Between Bay St. Anthony and Colares there is no good anchorage that can be recommended with safety, the water being very deep, particularly abreast the Bay de Sal, where you will have from 16 to 18 and 20 fathoms water, which is not the case any where else in the river. Colares bearing west about 5 miles, steer from S. S. W. to S. S. W. ½ W. You will then pass two small islands on your larboard hand, one abreast of the land, which forms the Bay de Sal, (S. part,) the other about 3 miles to the S. and W. In approaching these islands your course will draw you towards the land, but come no nearer than two miles, as there are rocks which stretch off about 1½ mile, with 7 fathoms close to them; therefore 8 or 9 fathoms is near enough. As you draw up with the south island, you make the Island of Tatuock nearly ahead. Be careful in drawing up to this island not to come too close to it, as there are rocks stretching off it to North Tatuock, between

2 and 3 miles. Leave this island on your starboard hand after passing the small island previously mentioned, 4 or 5 miles: you may then haul in for the land which forms the Bay St. Anthony. The shore becomes bold and without danger. The Bay St. Anthony is a fine clear bay, good anchorage all through from 5 to 7 and 8 fathoms, and by hauling into the bay if you want to anchor, particularly the southern part close in, which forms a lee, you will have the sea perfectly smooth, good shelter from the wind, and out of the strength of the tide: but if you want to proceed to town, steer across the bay, the wind being always fair for going up; you will then see several islands; keep between them and the point which forms the south part of the bay, (or Point Penheiro,) which is close to. You will soon see a small island called Paraquet Island, open to your view, and appears at a distance to be close to the main land. When you pass Point Penheiro, steer directly for it, leaving it on your larboard hand close aboard, as it is on the very edge of the channel. It is so bold close to this island that you need not be afraid to pass within the length of your vessel of it, and it is requisite you should pass close to it, as the channel becomes narrow as you pass it, having a shoal flat of sand on your starboard hand. The fort, which stands on a small island, will open plain to your view. About two miles distant from this island steer for it, giving it a berth of half a cable's length on the larboard hand, where you must send the boat on shore with your papers, or come to anchor; the latter is preferable for a stranger, as the channel is very narrow. When you weigh anchor steer for Para, or city of Belem, which will be open and plain to your view, distant about 5 miles from the fort, keeping the land distant about one mile on your larboard hand, and as you approach the town, haul in for the shipping, or custom-house, the next large building to St. Anthony's Church, which is the first or nearest church in coming up the river; then you may anchor abreast the custom-house, where you will have to land your cargo.

N. B.—There is a shoal of considerable length runs between the Island of Marajo and the main land that runs nearly north and south, which the sea constantly breaks on. Nearest distance of said shoal from the main land, being abreast of Colares, or that part of the land which forms the Bay de Sal, distant 7 or 8 miles.

High water, full and change, at Para, 12 o'clock.
Do. entrance between the shoals, 10 do.

From the mouth of the river, within Point Tigioca, the distance to the basin or anchorage of Para, is 20 leagues. All the western side of the river is shoal, but on the eastern side are even soundings of 8, 7, 8, 9, 10, 7, 10, 12, 9, 7, and 6 fathoms. In the basin itself are from 5 to 3 fathoms.

A vessel direct from sea, with good observations, may cross the equator on the meridian of 45°, where soundings, from 50 to 40 fathoms, may be found. A course hence W. by S. will lead towards Maracuno Inlet, on the east of which a pilot may be obtained. The soundings over the bank decrease gradually, from 40 to 15 fathoms: and it is to be observed that the flood tide sets strongly to the west, while the winds are from the east.

The flood sets into the Rio Para at the rate of 4 miles an hour. The beginning from the eastward is very rapid, and it veers gradually to the N. E. and N. The vertical rise is 10 feet.

Vessels outward bound, from Point Tapua, steer according to the tide, keeping that point S. E. to the distance of fifteen or sixteen miles. With Cape Magoary then in sight, haul up N. E. or N. N. E., taking care to avoid the banks of St. Rosa on the west. The wind here being generally from the eastward, with frequent squalls, great caution is required. In thick weather, when Cape Magoary cannot be seen, the approach to St. Rosa's Bank may be known by the soundings becoming irregular, which is not the case to the eastward of the channel. The weather shoals should be kept on board as much as possible.

Description of Pernambuco Bay, and Instructions to sail in and out of it.

Cape St. Antonio is the land vessels bound to *Pernambuco must endeavor to make first. The coast north of Cape Antonio forms a bay, in the centre of which lies Pernambuco. At the extreme end of this coast, N. 17° E., stands Olinda Point: half way from Olinda Point to Semambius, the church of Nossa Senhora Da Rosario is built on a height; its two towers are easily distinguished when coming from the main sea; going along the coast at two to four miles distance, there are 12 to 19 fathoms water.

When you have ascertained Cape St. Antonio, you must keep at two or three miles from the shore, until you perceive the Fort of Picao, between the N. W. and W. N. W., and then steer in a straight line to the fort built on the breakers, and you will near it until the Cocoa tree of Olinda (which stands between the two highest buildings of the city) appears N. ½ E. of you. In this situation you will stand within two or three

* At the entrance of Pernambuco a light-house is erected, showing a revolving light, as previously mentioned.

thousand yards of the breakers, which form a key. This anchorage is not of the best, large ships ought never go nearer, and it is prudent never to cast anchor in bad weather. West of the meridian of the Cocoa tree of Olinda, notwithstanding the contrary is generally prescribed, going to Pernambuco during the northern monsoon, it is best to make land on Olinda Point. From Olinda Point up to the Fort of Picao, there is a shoal extending two miles from the shore towards the sea, which makes it necessary to keep at three miles distance, and by a depth of water from 8 to 10 fathoms, until the Fort Picao stands west, a few degrees towards the north, by which you will avoid the English bank, which is formed by sandy rocks lying at the southern end of Olinda bank. That does not extend further east than the meridian of Olinda City, nor farther south than the parallel of Fort Ciesco. The sea breaks there with great violence in heavy wind, though there are 2 fathoms of water. Small vessels may avoid it to the west and north, keeping at half a mile from the main land from Pernambuco up to Olinda Point, but this vessel shall not require over three to five fathoms, and it is indispensable to have on board a pilot for the place.

The Harbor of Pernambuco is not a very safe one, for vessels of a great draft of water are not able to cross the bar; for the swell of the sea is very great outside, and if too near the shore, there will be great danger should the anchor drag or the ship fall to the leeward, when getting under sail, which may become indispensable shoul the wind turn S. S. E. or E. N. E., as is the case in the month of March and September. During the northern monsoon the prevalent winds are from the east, particularly at the time of new or full moon, and though the weather is clear and fine generally, yet it requires to be careful in the anchorage, and the surest will be not to cast anchor too near the shore, the bottom being very rocky, and requisite to make use of chain cables in this place more than in any other. Large vessels will do well to be all times in readiness to get under sail, and prudenee requires to let fall every evening a second anchor for safety during the night.

If there is any necessity to remain a long time at Pernambuco, the best way will be to cast the two anchors off the cat-head, toward the main sea, with another toward the W. N. W., on the stern of the ship, in order to prevent the ship from swinging during the calm which comes after every squall of wind.

The harbor of Pernambuco is sufficiently spacious and deep for vessels from 10 to 12 feet draft of water; it is divided into two parts; the interior part, which is called the Poco, (the Well,) is an anchorage situated on the northern end. The entrance is formed by several rocks or banks of small stones. There are from 17 to 30 feet water on the bar, as well as inside. The shore is sandy, and the water decreases in depth, in proportion as you go toward the land. The only guard vessels have from the winds coming from the sea, are the rocks, or breakers, before stated; but they are very deficient for that purpose, and during the southern monsoon this place is not at all safe. The second part of the fort is called Recife Port: it is comprised between the natural quay of rocks and the city: it is also called Mosqueirao. This harbor is better guarded than the former, by the quay of rocks, which, at low water mark, are from 8 to 10 feet above the sea; but to reach in the Mosqueirao, it is necessary to cross the bar, on which, at low water mark, there are but 7 feet water.

If you wish to carry your vessel in the Poco Harbor, you must proceed as follows:—Being situated as we have already stated, inside of the English Bank, the cocoa tree of Olinda N. ½ E. of you, you must see a small pyramid built on the shore, in a straight line with the church of San Amarao, which is surrounded with cocoa trees; in this situation the church and pyramid stand very near the west of the wood, and you must follow that direction until you perceive south of you the Fort Picao. If you wish to go into Mosqueirao you will have to steer S. ½ W. from that place.

Small vessels sometimes used to pass through the south entrance to reach Mosqueirao, which is at the northern end of the quay of rocks, whereon Fort Picao is built. The mark to direct your course in this case is, to keep the two corner towers of the southern end of Fort Brun in the same direction, and consequently the one covering the other, and true west; sail in this direction until you see the Fort Picao south of you; then steer along the western side of the breakers, and you will reach the harbor. There is no great danger in going near the breakers; it is customary with pilots, when called, to come to take vessels lying in the bay. We again repeat, that vessels trading with Pernambuco must not draw over from 10 to 12 feet water.

The two harbors of Pernambuco are safer than the bay, ships being sheltered from the too great swell of the sea by the breakers, or quay of rocks; but when the wind stands east and blows hard, it requires to be well secured.

The prevalent winds are, as in the tropical climate, from S. S. E. to N. N. E.; from March to September, they are more toward the south, and sometimes S. W.; during the other six months they stand E. N. E. and N. N. E.

Description of the Coast comprised between Cape St. Antonio and Olinda Point, the mouth of the St. Francisco River, and Cape St. Augustine.

From Itapuanzinho Point up to Itapuan, the coast bears no longer the same appearance as it does previous to your arrival at Bahia. Here the shore is but sandy and low, few trees are to be perceived at a distance, and from place to place some cocoa trees. All along the shore a ridge of rocks are to be met, and in many instances they rise above the level of the sea; the one at the Itapuan Point particularly, seems like small islands. Thirty-eight miles farther N. 45° E. of Itapuan Point you are opposite the Torre de Garcia of Avila, a kind of fort, built on the top of the coast, among the trees, and which is now used as a house for signals. The coast, viewed from 9 to 10 miles distant, appears like a wall of great magnitude and equal height, except where the two rivers, San Joannes and Jacuhype, discharge into the sea, where a large cut appears in this wall. The depth of the sea is very great opposite this place, for being only 10 miles distant, no sounding is to be met. From Torre of Avila up to Oiteras of San Miguel, the shore is more high, but with small hills.

All the coast from Rio Real up to Rio St. Francisco is low and sandy, with small broom bushes, and small hills are discovered at no great distance in the interior. A vessel may approach very near the land, the bottom is sandy, with gravel and broken rocks. The next river after Rio Real, is Rio Sergipe, which is 21 miles distant from Vassa Barris. The mouth of this river, when viewed at no great distance, is easily distinguished by the three small hills of an equal height, all covered with briars, lying 9 miles S. W. of the bar. These hills are called the Ostres Irmaos, (or Three Brothers.)

At the mouth of the Sergipe River, a very white sand beach is to be seen, whose color strikes with the green ground of the coast all around. At the bar the sea breaks with great force at the time; from which we must infer a shallow water. The rivers which come next in succession are, Cotombeda River, near the Miserias Point, and Japaratuba Points, south of the mountains of Pacatuba; the country round Colindiba River, is one of the most productive in sugar, cotton, tobacco, &c. There are but 7 feet water at the bar. When viewing the bar W., the Mount Aracajou stands a few leagues N. W., and in the west Morro Telha is discovered. The Mount Aracajou seems to run in a parallel direction with the coast, and in its northern extremity a deep cut is to be perceived. The second mount bears the shape of a Quaker's hat. The coast from Rio Idaparatuba up to St. Francisco River, is very dangerous in a strong S. E. wind, for vessels going near the land, they having no good chance to escape the wind, and the bottom too hard for the anchor to have a good hold in it. Prudence requires to keep at some distance from it.

Near St. Francisco River the land is very low, and cannot be seen even at a short distance, for which reason great care is required to make land near St. Francisco. The only mountains to be discovered at a distance are the Itabayanna and Pacatuba, but only in fine clear weather, and when exactly opposite the River St. Francisco. The entrance of this river lies south of Manguinha Point, which is very low, and all covered with Mongel trees. It projects E. S. E,, and, at 1½ mile distant from it, in its direction, there are dangerous breakers. The north of the entrance is formed by a land more low than the former, having a white sand, and in its projection into the sea there are no less dangerous breakers than on the other southern points. It is between these breakers you must cast anchor until a pilot comes on the bar. There are from 12 to 13 feet water; the country is very populous, well cultivated, and produces great quantities of sugar; when near, the land from St. Francisco River up to Alagoas is low and sandy, and a ridge of rocks, at no great distance from the shore, is to be seen. Many small rivers discharge into the sea, but none of a sufficient depth to be navigated; they may be approached very near without danger.

Opposite Cururippe, three miles distant from the shore, stands the rock of Dom Rodrigo. This rock, as well as several smaller ones, to be seen only at low water mark, have been designated by some as the Cosmographer Banks of St. Francisco, and stated to be very dangerous, but without the least reason. We found all around this place a great depth of water, and the shallow water will not extend over 3 miles. In supposing it to extend as far as the Iquia, as there is no reason to keep so near the land, one will do better, at all events, to remain at a greater distance than 4 miles. An important observation is to be made on this part of the Brazil coast, and agreed to by the natives, which is this, that the land breeze, during the night time, is hardly perceived, when 4 or 5 miles from the land, but at daylight it begins to reach that distance, and seems to attract the eastern wind towards the north until 12 in the morning; and afterwards the eastern wind returns gradually towards the east: from that fact vessels may derive some benefit on either course, when obliged to beat. Near San Miguel the shore is very bold, and nearly 80 feet high, and the top perfectly even and horizontal for an open space of 15 miles. When coming from the southernmost, the village of Macayo is to be discovered on the top of a highland. The church is easily distinguished; and for

this reason the place deserves notice. The Jaragua River empties below Macayo, and the point which forms the northern land of the mouth is covered with cocoa trees, and very animated breakers are to be seen at some distance in its direction. North of Macayo, and from the interior, the Mount of Marambaya is discovered, even at 45 miles distant. This mount offers this particular, that the country on which it stands, though high, is very level on every side of its base. The shore north of Macayo is sandy, and from place to place of a reddish color; low trees are seen not far distant from the shore. The Fort of Tamandare, though not very important, deserves some notice, being the only place affording a safe shelter between Bahia and Pernambuco. This anchorage is formed by a deep cut into a bold shore, and is sufficiently large and deep for admitting large vessels.

Nine miles N. ¼ N. E. of Tamandare Harbor, lies the small island, or rocks of Alexo, situated at the mouth of the small river Serenhen. Previous to your arrival there, the bar of Rio Fermoso is discovered. When you observe the two rocks of Alexo together, they stand N. 6° W.; then north of these two rocks, Monte Do Sella is discovered in the interior, which derives its name from its shape, (Little Saddle,) and may be useful to ascertain the situation of a ship.

Being a few miles east of the rocks of St. Alexo, you will distinctly perceive the Cape of St. Augustine, lying 16 miles N. 18° E. This cape is hardly covered with wood, and not very thick; it is of moderate height, which decreases gradually towards the sea. It offers the particular remark, that a steep beach of a red yellow color is to be seen in many places of it: it has a barren prospect when nearing it; on its top there is a church; towards the north side, a little below the church, fortifications are to be seen.

Description of the Bay of All Saints, or Bahia—Instructions to go in and out of this Harbor.

Vessels bound to Bahia during the southern monsoon, should make land near San Paulo. If during the northern monsoon, they will do better to make land north of Itapuan, which is a little further north than Cape St. Antonio. Upon the whole, this will depend on the accuracy of the day's work, the actual situation of the vessel, and the wind to be met with when near the coast. The main entrance of the Bay of Bahia, called likewise St. Salvador, is formed by the cape, or promontory, of St. Antonio on the east, and by the Island of Itaparica on the west. The mean distance from the Cape St. Antonio to Itaparica Island is not less than 4 miles: but the one-half only of this channel, which is towards the main land, is safe for navigation of large ships. If from the Morro San Paulo, you steer N. 46° E., with a favorable wind, you will pass at the proper distance of the bold shore of Itaparica Island, and of the breakers of St. Antonio; but if you are obliged to beat, it requires care to avoid both places.

Nothing is to be feared by keeping at equal distance from the main land, on which stand San Paulo, Mount Arod, Itaparica, until you discover towards the north, the Jaburu Point, which is the eastern end of Itaparica Island. Arrived opposite Point Aratuba, you are now 7 miles from Jaburu, and 5 miles S. 41° W. of Cape St. Antonio, and nearly 3 miles W. of the southern extremity of the breakers of St. Antonio. From that situation you must direct your course straight towards the Cape of St. Antonio until two miles only from the shore; from thence steer straight towards the church of Bom Fim, (situated on the Point of Montferrate,) until you reach the Fort Do Mars, or Sant Marcello, near which is the usual anchorage.

The Flat of St. Antonio, lying 4 miles S. ½ W. of Cape St. Antonio, there is no difficulty to avoid it, and is altogether not very dangerous. It is a sandy bank of a reddish color; no rocks are to be met there, and 4 fathoms of water are to be found every where. Such is the opinion of the natives, and of the most experienced men; but having perceived some places where the sea breaks on this bank during strong wind, I would suggest to keep a distance from this place with a large ship, which is the case when following the course we have described. The general anchorage for merchant vessels is inside of the line drawn from the Fort of Marto Montferrate Point. It is necessary when going to this anchorage to avoid the sandy bank of Panella, which we had no chance to ascertain, but it is reported by the natives as a very shallow water, of 3 to 3½ fathoms only, lying W. ¼ N. from Fort Do Mar.

It is generally the case that the wind permits you to come to anchor in front of St. Salvador, the most prevalent wind being from E. and from S. E., and vessels can generally go in by plying small board. During the night time, the breeze comes from several points of the compass, but more generally from the land side. The tides are perfectly regular from St. Salvador, and the flood and low water last an equal time. The harbor is very safe, and there are only a few instances when a strong wind from S. W. blows, that the water is much swelled, and the ships do not ride easy.

The course to follow when going out of St. Salvador is very near the reverse to the one to proceed in. When one mile distant west of Cape St. Antonio, and steering 4½ miles S. S. W. of the same, the shallow water will be avoided, and afterwards you may

go round the cape into the open sea. All the lands near Cape St. Antonio are tolerably high, if compared to those of the opposite side. They are of a pleasing appearance, being covered with trees, and a luxurious vegetation of a green color. This shore, in fine weather, can be discovered from 30 miles distant. On the end of St. Antonio Cape stands a light-house, containing a brilliant revolving light, showing two white sides and one red, the latter to be seen once in every four minutes, situate on the same site as the former one—viz.: Fort Santo Antonio da Barra, but much higher, being above 140 feet above the level of the sea, and is visible at a distance of about 25 miles. In the day-time, when the light-house bears W., the Fort of St. Antonio appears as separated at a small distance from the main land. Two and a half miles east, a few degrees south of the light-house, there is another land point, on the top of which stand the poles for signals. This last point forms with the Itapuanzinho Point, which stands one mile east of a small bay. Many houses are to be seen along the sea coast.

ISLE OF TRINIDAD AND MARTIN VAS' ROCKS.—*Descriptions and Directions.*—In approaching Trinidad from the eastward, when running on its parallel, you will make the three islets or rocks of Martin Vas', which may be seen at the distance of 8 or 9 leagues from a ship's deck. These rocks are very remarkable, and cannot be mistaken. They lie north and south of each other, the distance from the outer rock being about 3 miles. The central rock is very high, with tufts of withered grass scattered over its surface. The other two are entirely barren. There is a passage between the southernmost and central rocks. The northernmost almost join. In clear weather Trinidad is distinctly seen from the rocks of Martin Vas', and may be descried 16 leagues off.

The island is about 6 miles in circumference, the land very unequal, and at best no more than a cluster of rocks, with some shrubs in the valleys. The northernmost side is quite barren, but to the southward all the interstices of the rocks are filled with evergreens of several kinds. There is also a quantity of sea fowl and rock fish, and many wild hogs. The generality of the wood is very small, though there are trees of eighteen inches diameter towards the extreme heights.

Trinidad is surrounded by sharp rugged coral rocks, with an almost continual surge breaking on every part, which renders the landing often precarious, and watering frequently impracticable; nor is there a possibility of rendering either certain, for the surge is often incredibly great, and has been seen during a gale at S. W. to break over a bluff which is 200 feet high.

The island is supplied with very good water from two small streams down the E. and S. W. sides of it; besides a small issue from the rock which forms the S. W. extremity, not one of them will fill a tube of six inches in diameter, and there is a doubt whether these run temporary or perennial, though they always produce a small quantity of water, sufficient to preserve the existence of a few wretched inhabitants. Lieut. Thomas Harrison, from whose account this detail of Trinidad is chiefly extracted, speaking of the anchorage, says that they anchored off the west side of the island, at a mile from the shore, to be able to weather it on any tack, should the wind happen to blow on; "being directed," continues that gentleman, "to do so by Captain De Auvergne, who informed us of the wreck of the Rattlesnake, and the miraculous escape of the Jupiter and Mercury." They prudently avoided the common anchorage, which is about a musket shot from the shore, in 18 or 20 fathoms water. On that side there stands a stupendous arch or hole in the rock, like that of Fernando Noronha, and two very remarkable rocks, one called the Monument and the other the Sugar-loaf.

The Monument is 850 feet high, of a cylindrical form, and almost detached from the island, with large trees growing on its top. This had been named in 1700, by Dr. Halley, the Nine Pin. The Sugar-loaf, at the S. E. end, is 1160 feet high, of a conical form, with trees likewise on its summit, and whenever it rains hard, a cascade of 700 feet makes there a beautiful appearance. The arch is a natural passage made by the sea through a high bluff of about 800 feet high. It is 40 feet in breadth, nearly 50 feet in height, and 420 in length: the depth of water above 3 fathoms. When the sea is moderate, you may see through this arch into the only bay in the island, and have a view of a distant rock covered with trees, which renders the prospect extremely picturesque.

Lieutenant Hamilton says, "we first saw the island on the 5th of June, on our passage to the Cape of Good Hope; we had then variable winds and calms; and on making it a second time, on the 8th of November, we had exactly the same winds and weather, accompanied with a heavy squall of wind from the westward. During our stay there, above two months, the prevailing wind was from N. N. E.: hence I conclude the S. E. trade wind is not to be depended upon, although the island is so far within the tropic of Capricorn.

The American commander, Amasa Delano, visited Trinidad in 1803, and he again describes it as mostly a barren rough pile of rocky mountains. What soil there is on the island he found on the eastern side, where there are several sand beaches, above one

of which the Portuguese had a settlement, and have, he says, done much to work streets or roads over the valleys, levelling down small hills to make the roads good. They had walled in a number of enclosures for the purpose of making fields, at the expense of much labor.

This settlement was directly above the most northerly sand beach on the east side of the island, and has the best stream of water on the island running through it. It might be possible, he adds, in pleasant weather, to get it off from this place, but we got ours off the south side from the next best watering place or stream. This falls in a cascade over rocks some way up the mountain, so that it can be seen from a boat when passing it. After you have discovered the stream you can land on a point of rocks just to the westward of the watering place, and from thence may walk past it, and when a little to the eastward of the stream there is a small cove between the rocks, where you may float your casks off.

Wood may be cut on the mountain, just above the first landing place, and you can take it off if you have a small oak boat. The method in which we filled our water was carrying it in kegs and buckets to the place where we floated our casks on shore.

All the south side of the island is indented with small bays, but the whole is so iron-bound a shore, and such a swell surging against it, that it is almost impossible to land a boat without great danger in staving it. The south part is a very remarkable high square bluff head, and is very large. There is a sand beach to the westward of this head, but I should caution against landing on the beach till it is well examined; for just at the lower end of the beach, and amongst the breakers, it is full of rocks, which are not seen till you are amongst them. Where we landed we saw the remains of at least two or three boats which had been knocked to pieces by landing. We found plenty of goats and hogs. The latter were very shy, but we killed some of them and a number of goats. We saw some cats, and these three sorts of quadrupeds were the only animals we saw on the island. If a ship is very much in want of good water, it may be got at Trinidad; or if the crew should have the scurvy, it is an excellent place to recruit them in, as you can get plenty of greens on the S. E. part of the island, such as fine purslane and several other kinds. These, together with the fine sweet water, would soon recruit a crew. A ship must never be anchored at this place with common cables, or she will be likely to lose her anchors; but if she has chains for her anchors, the rocks cannot cut them. The navigation is safe for a ship all around the island within the distance of a mile. Martin Vas' Rocks, or more properly Islets, lie about east, 9 leagues distant, but there do not appear to be any dangers between them and Trinidad.

MARTIN VAS' ROCKS.—These rocks, as noticed above, are high and barren. The central one is the largest, and it may be seen from a ship's deck at the distance of 10 leagues. When bearing south, the rocks seem nearly in a line. The northern and central rocks are near each other, but between the central and southern rocks is a good channel. Here the Chesterfield, in 1800, observed the latitude 28° 28′, when she hove to in 12 fathoms, with the largest rock E. N. E., about a mile, the bottom then visible, and caught plenty of rock cod and other fish. The boat in sounding found the depth decrease gradually over a rocky bottom to a fathom and a half, close to the largest rock.

The north rock is small and most westerly; all are steep and inaccessible: the distance between the extremities is about 3 miles; that to Trinidad, as already noticed, about 9 leagues.

ASCENCAO, or PORTUGUESE ASCENSION.—An island distinguished by this name, has formerly been described, and said to be at the distance of about 100 leagues to the westward of the Isle of Trinidad. Doubts have long since been entertained as to its existence, and we have the best reason to believe that they are verified. La Perouse, in 1785, sought for it without success as far as the longitude seven degrees west of Trinidad, and M. Krusenstern, in 1803, prosecuted the search so much further to the westward, that its non-existence within 37° west appears certain. Add to this, that the Governor of St. Catharine's informed Mr. Perouse that the Governor General of Brazil had despatched a vessel in the preceding year to survey the island, but it could not be found, and it had consequently been expunged from the charts.

Notwithstanding this, it has been said that land was seen by the commander of the steamer Telica, on her passage to Peru, in 1825, which appeared to lie in latitude 20° 35′, and long. 37° 8′, or nearly so. At noon the vessel was in or about 20° 20′ S., and long. 37° 28′. The island (if land) bore S. E. by E. ½ E., by compass, distant by estimation about 8 leagues. But we mark this as very doubtful.

CONGRESS BANK.—In Brackenbridge's account of the voyage of the U. S. Frigate Congress to Buenos Ayres, in 1817, it is reported that Commodore Sinclair found some extensive rocky (coral) soundings of 35 fathoms, and lost them in latitude 20° 30′ S., and 37° 30′ W.

Description of the Coast between Rio Janeiro and the Bay of All Saints, showing the Anchorage in the Harbor of Espirito Santo, Porto Seguiro, &c. &c., and near Capes Frio, Thomas, St. Paul, and St. Antonio, with a Description of the Banks and Small Islands of Abrolhos.

Leaving the Bay of Rio Janeiro to proceed eastward, 14 miles distant, E. 15° S. of the Sugar-loaf, you will find the two islands of Marice, situated nearly one league from the shore; they are not very high, their southern shore is quite perpendicular, and there is no danger in going near them.

At 14 miles farther N. 77° E. of these islands, you meet Cape Negro, which is formed by a hill not very high, adjoining to the highest mountains to be met with between Rio Janeiro and Cape Frio, which, with its dark green tinge, (from which it derives its name,) are quite sufficient to distinguish it. There is not the least danger in nearing it, for even at the distance of 3 miles, the soundings are from 30 to 40 fathoms, muddy bottom.

The sea shore from Rio Janeiro to Cape Frio is low and sandy: the mountains which surround that bay run first E. N. E., until you reach the meridian of Cape Negro, and afterward N. E., leaving an empty flat between, over 10 leagues in extent, which is to be seen from the sea in fine weather only.

Between Cape Negro and Cape Frio the land is low, and a few small hills are to be perceived at some distance from the sea shore, which is there sandy and bushy. On the top of one of these small hills, 9 miles E. N. E. from Cape Negro, stands a church dedicated to Nostra Dama de Nazareth. At no great distance from the shore a ridge of rocks and sand are to be seen at low water, and considered dangerous by the coasting traders, but without good reason, as there are 30 and 40 fathoms water at 6 miles distant, muddy bottom, the depth increasing very fast toward the sea, and at 10 leauges distant, from 70 to 90 fathoms, bottom sandy, rocky, and muddy.

Though of little importance, it is proper to state that inside the beach, a flat of water can be seen. The depth of the sea near Rio Janeiro is very great, varying from 76 to 90 fathoms, at the distance of 10 or 15 leagues, diminishing gradually toward the land. The bottom is a mixture of coarse sand, gravel, broken shells, rocks, and mud. In some charts, S. S. E. from Cape Frio, distant 10 or 12 leagues, from 20 to 25 fathoms have been marked, but we believe it incorrect.

CAPE FRIO (on which there is a light-house, with a revolving light, which is visible two minutes and eclipsed two minutes, and can be seen 40 miles in clear weather,) is the southern side of an island lying on the eastern end of the beach of Maranbaya. This island is rocky; there are trees only in some places, and no where is green grass to be seen. In fine weather it may be discovered 15 leagues distant. Viewed from E. and N., two different hills are to be perceived on Cape Frio, the northern one of which is the largest and highest, and on the southern one a kind of rock seems to project and hang over. Viewed from the N. N. E. and S. S. E., these two hills appear to be but one with tops, and at a small distance from the cape, in an E. S. E. direction, lies a small island of a conical shape. All this shore is so bold that 30 and even 40 fathoms are to be met in every direction, even at one mile distance, bottom almost every where mud.

Between the Island of Frio and the main land there is a good channel for small vessels, and a good anchorage for others of any size. The channel runs N. E. and S. W. It is not frequently used, on account of its narrowness at the southern part, but the depth of water is every where more than sufficient. The northern passage is very spacious and safe against any wind except N. E.; but by anchoring more north toward the island Dos Porcos, you may consider yourself perfectly safe, the anchorage being firm, and often resorted to by coasting traders, who wait there for favorable winds, and for a chance to put to sea through the southern or northern passage. In time of war this place may be useful to get information. Variation 2° 3′ E., 1819.

The northern part of the coast of Cape Frio, together with the islands, runs N. 35° E. up to Anchora Islands, and forms with this last a deep bay, in the inside of which stand the numerous islands of Papagaros; several of them afford very safe anchorage in case of contrary wind.

The Island of Anchoras stands at 4 miles E. ½ S. from Cape Busios; the eastern one has the appearance of a Quaker's hat. I do not doubt, as reported by native mariners, the practicability of a large ship to pass between them and the main land.

North of Cape Busios lies the small island of Branca, from whence another beach extends to the Morro San Joao, or San Joam, and at no great distance the Island of Feno. The land now runs easterly up to Cape St. Thomas. This gulf, formed by the coast between the Capes Busios and St. Thomas, is very near 30 leagues in extent, and in the middle of it, at 3 leagues distance from the shore, lies the Island of Santa Anna.

The Morro San Joam is easy to be distinguished, being entirely separated from the chain of mountains lying in its rear, and its top having a warlike appearance.

At twenty miles N. ½ W. of Morro San Joam, another hill is to be perceived, which offers this particular, that its northern side is quite perpendicularly cut, and its top ends in a sharp point. It is known by the name of Father de Macaye, or Macahe.

The islands of St. Ann are three in number. Viewed from S. S. W. and N. N. E., they appear as one only. The southern one is the highest. The anchorage in the channel is one of the safest and most convenient for any kind of repairs, and to refit vessels of any description. Good water and timber are to be found; and at the distance of four to five miles from the shore, there is, in every direction, from 19 to 30 fathoms of water, and a good mud bottom.

From the parallel of the Island of St. Ann up to Benevente, which stands in latitude 20° 53′ 50″ S., a flat land projects considerably into the sea. That low land is known by the name of Granes. Some navigators bound to Rio Janeiro, state that they have been deceived by the similar appearance between the coast north of Cape Frio and the coast forming the bay of Rio Janeiro. Such an error appears very extraordinary, for the entrance of Rio Janeiro is on the angular point of two chains of mountains, the eastern side running E. ½ N., and the western side running W. S. W.; whereas the land north of Cape Frio runs N. and S., which is quite an opposite direction. On the whole, a single observation will relieve the doubts in that respect.

CAPE THOMAS.—From the Island of St. Ann to Benevente End, the land extends more and more to the sea; and at Cape Thomas the mountains appear to be thirteen leagues from the sea shore. This part of the Brazilian coast is very low; a few trees and small sand hills seem as buried in the sea water. This beach extends far in the sea, and forms what is called the Banks of Cape Thomas. The chart shows how far the shallow water extends. At the distance of five miles we found from 10 to 21 fathoms, increasing regularly towards the sea. By keeping fifteen miles from the shore there is not the least danger.

Though some coasting traders state that places on the banks are to be met with, having 2 or 3 fathoms of water only, yet the pilot we had on board thinks differently, and nothing has been perceived by us to indicate such a shallowness.

The nature of the bottom near Cape Thomas is not of a muddy nature, but white sand and broken shells. It should here be observed, that this white sand, which extends so far north, appears to begin only there, and is never met with farther south.

At a short distance from Benevente you meet, in succession, the Barra Guarapaya, (Bald Island,) La Rosa, and the small islands of Guarapari.

The River Guarapari empties into the sea between two hills covered with trees. On the top of the southern hill there is a church with a steeple, many houses and cocoa trees. The other hill is called Perro de Cao. To proceed up the river it is necessary to keep Guarapari Hill N. W.

The surrounding coast is tolerably high, and every where covered with small trees, and in several places a yellow steep beach not perceived to the southward of Benevente. The mountains in the interior deserve particular notice, being of a conical shape, and appearing to incline on one side, which is not to be observed the south or north.

ESPIRITO SANTO.—The Island Calvada lies 4 miles distant from the shore. There is no danger passing in the channel, being from 12 to 20 fathoms water. Outside this island, and off the Island Rosa, the depth varies from 12 to 20 fathoms up to Espirito Santo Bay. Keeping at the distance of 2 to 7 miles from the shore, at nearly two-thirds the distance from Guarapari Santo, you meet the rocky Island Jien, and a little farther distant the Pacotes Rocks, which indicate the entrance of the bay of Espirito Santo. The particulars which distinguish Espirito Santo Bay, are Monte Moreno and Mertue Alvara. Monte Moreno is a mountain on the southern end of the bay, its northern base forming the southern entrance of the river of Espirito, is of a conical shape, covered in part with wood; no green grass to be seen on its eastern side, and may be discovered 10 leagues distant. Vessels going up the river must range along it at no great distance. The two Pacotes Rocks stand 2½ miles, and are of unequal size. The inside channel is used only by small vessels.

Nearly one mile distant from Monte Moreno, S. 60° W., stands the Morro de Nozza, (Sembora de Poria,) a rocky hill with little wood. The church, which is built on its top, can be discovered 5 leagues distant. What distinguishes the hill called Mastre Alvaro, is its great height on a low ground, appearing as entirely separated from the other mountains.

The greatest part of the Bay of Espirito Santo is occupied by two islands, in a direction N. N. W. of Monte Moreno. Though the space between this island and the mountain appears to be wholly obstructed by banks, and the two rocks, the Balea (the Whale) and the Casello, (the Horse,) yet a vessel not drawing over 16 feet water may easily go through there without danger, as you will not have less than 18 feet water. The anchorage we occupied in the bay of Espirito Santo was not the best one, because we had no knowledge of a submarine rock not more than two cables distance from us,

where, from time to time, the sea was breaking. The safest place to anchor is the one pointed on the chart, with an anchor.

Espirito Santo is of some importance to navigators. At one league's distance from the city of Victoria, there is good water. Wood and cattle can be got in plenty, and cheap. The climate appears unhealthy, being extremely damp. A rock called the Pao de Hanuar, (Sugar-loaf,) about 2000 yards from the city, is of some service to mariners, as you steer in its direction after weathering Monte Moreno, if you intend to get into the river. The tides are not more than 4 feet, and are regular but in the inside of the bay.

The coast north of Espirito Santo is low and covered with trees; and the shore, which runs N. 32° E. from the Tubaron, (the Shark) up to the bar of Rio Doce, nearly 16 leagues distant, is of a yellow red color.

From Rio Doce (Soft River) the coast runs north and south up to the bar of San Matheo, a distance of 20 leagues. The country in the interior does not appear so low as the sea shore, but from Rio Doce to Mount Pascoal the country is very flat. There is consequently no more difficulty in recognizing Espirito Santo Bay when coming from the south or from the north, as in the first instance Mount Mastre Alvaro comes next to the flat land, and in the second instance it ends a land tolerably high.

The shore from Tubarao end up to San Matheo, may be approached every where at the distance of 2 or 3 miles. From 9 to 10 fathoms water are to be found at such a distance, sandy bottom, sometimes muddy, and with broken shells.

It is reported Rio Doce runs far in the interior, but its mouth does not admit of large vessels. It is to be observed here, that the numerous islands pointed out in some charts, as existing at its mouth, is not correct.

The bar of Rio Seca lies ten leagues north of Rio Doce. Rio Seca is a stream only in the rainy season. Two miles east of Rio Seca we found no variation in the compass, July, 1819.

The bar of San Matheo is 10 leagues distant from Rio Seca. Being far at sea, this bar may be distinguished by the breakers of the sea, which are greater than on the surrounding places. The shallowness of the water, the impossibility for a ship to cross over the bar, and above all, the little benefit to be derived from this place, are more than sufficient reasons to keep at a distance from it.

ABROLHOS.—At a distance of 4 to 5 leagues from San Matheo, in a northern direction, and at 3 to 4 leagues from the land, the soundings begin to indicate the shallow water of the Abrolhos. This shallow place may be considered to extend north and south from 18 to 20 leagues, and east and west not less than 20 leagues: and though the whole extent is not to be considered equally dangerous, yet a vessel not particularly bound to this place, will do well to keep away from it.

The Abrolhos Islands, or Santa Barbara Islands, are four in number, not including two or three flat rocks. The two northern islands are the highest. The western one is nearly 130 feet above the sea; the other 115. They may be perceived from the top of a frigate in fine weather, from 20 leagues distance.

Nothing is to be found on this island except some reeds and cactus. Numerous tribes of birds inhabit them. A few turtles are to be met with. Fishes are in plenty, and the fishermen of Porto Securo repair there to fish, and dry what they call garoujas. This is consequently the only thing a vessel can expect thither.

We have already stated that the whole extent assigned to the shallow water is not every where dangerous. In the same extent, by our observations and soundings, it appears that from the E. S. E. up to S. by N., and W., large ships may approach from 1 to 8 miles, in fine weather. The only part we had no chance of sounding, and which remains consequently doubtful, is that part comprised between the S. and S. S. E.

West of this island there is a channel of nearly 3 leagues wide, where the soundings show from 10 to 15 fathoms, except in a few places where it shows only 8 fathoms. The western side of this channel is formed by more shallow water, called the Paredas, (or Walls,) which is very dangerous. According to the report of the native mariners, the tides are irregular on the Abrolhos; the current runs according to the wind, and does not run over $\frac{3}{10}$ of a mile an hour. The soundings show no mud over the whole extent we ascribed to the shallow water of Abrolhos, and if any is to be perceived, it is a certain sign we are no longer there. The nature of the bottom in the Abrolhos is white sandy stone, mixed with broken madrepore* in a powdered state. Sometimes that sandy gravel is very firm and combined with sand and rock, particularly in the N. E. direction. In the direction of S. S. W. or N. E. by W., the bottom is very firm and like tough mortar, in which the anchors have a good hold, though they enter very little into it. We have no current information respecting the Paredes, which are stated in the chart, according to the saying of the native mariners, beginning at the bar of Portalegra, and ending at Alcobaca.

* Every kind of stone supposed to be formed by insects, is called by the French, madrepore.

Extract of a letter from Capt. Fitzroy, of H. M. sloop Beagle, to Capt. Beaufort, R. N., on the subject of the Abrolhos Banks, dated "Rio de Janeiro, April* 10, 1832.

"On the 18th of March we sailed from Bahia, and worked our way slowly towards the eastern limit of the Abrolhos Banks. The winds, being light and easterly, favored our soundings frequently, and taking good observations.

"Having reached the parallel of the island, to the eastward of the easternmost soundings laid down in the charts, and finding no ground with 300 fathoms of line, I began to steer westward, sounding continually, and keeping a sharp lookout at the mast-head. At 2 P. M., on the 26th, we had no bottom with 230 fathoms, and at 4 P. M. we found only 30 fathoms, without the slighest change either in the color of the water or in its temperature, or any indication of so sudden a change in its depth.

"I directly hauled to the wind, and worked back again to the eastward, to have another opportunity of confirming the place of the edge of the bank. We lost soundings as suddenly as we found them; and in standing to the westward a second time, with a grapnel towing astern with 200 fathoms of line, we hooked the rocky bottom, and straightened the grapnel; but my object in ascertaining the exact beginning of the bank was gained.

"From that spot we had soundings in less than 40 fathoms, until we anchored near the Abrolhos Islands.

"I passed to the southward and eastward of them, because that side had not been examined; but time would not allow of my doing what I wished while so favorable an opportunity offered.

"At least a fortnight would be necessary to complete the survey of Baron Roussin, which appears, so far as we have examined, to be extremely correct. The soundings are so irregular, that little dependence can be placed on the lead. It is only by a multitude of soundings, by watching the sea when there is much swell, and traversing every part, with a sharp lookout at the mast-head, that the neighborhood of the Abrolhos, particularly to the south-east, can be thoroughly examined.

"More than once we had four or five fathoms under one side of the vessel, and from fifteen to twenty under the other side. The *sauts de sonde*, as the French express it, are surprising.

"The tide, or rather current, which we experienced, are continually to the southward for the three days we were near these islands, varying from half a mile to a mile and a half an hour.

"I supposed that the bottom was chiefly composed of coral rock, but was surprised to find no coral excepting small fragments growing on the solid rock, which is chiefly gneiss and sandstones. As the charts say '*coral rock*,' I have sent a few of the soundings for your inspection; and you will see by them that what has here been called coral, is the coating of a solid rock, formed by the deposite of the sea-water, mixed with coralline substances, and what a sailor generally calls 'barnacles.'

"My meridian distance of the Abrolhos Rocks from Bahia, their latitude, and their size, agree precisely with those given in the French survey; but between Bahia and Rio de Janeiro, and consequently between the Abrolhos and Rio de Janeiro, there exists a difference of from four to five miles between us, this being the only point on which I have found any such difference, either on this or on the Beagle's former voyage.

"Having made both passages, I venture to observe, that going within the Abrolhos certainly shortens that between Rio and Bahia very much; but yet I should not recommend it to any vessel unless she has reason to make unusual haste. The soundings are very irregular, varying suddenly from 20 to 6 fathoms; and there are both reefs and currents."

The little city of Prado lies on the mouth of the river Incurucu, a very deep cut amongst the trees, which are numerous on the shore, at the place where the river discharges into the sea. There is no danger near the mouth; even at three miles there are from 10 to 14 fathoms of water. This depth remains the same as far as the village of Columbiana, situated E. S. E. of Mount Pascal. Mount Pascal is to be perceived even from the Abrolhos.

E. by S. 28 miles from Mount Pascal, in a direction north and south, and at 12 miles distant from the coast, the water is very shallow, intermixed with rocks. That dangerous place is called the Itacolomis, and runs E. S. E. and S. by W. There is not the least danger by keeping away 13 miles from the shore, and when north of Mount Pascal the land may be neared to 3 miles, the depth being from 11 to 24 fathoms.

Mount Pascal, as we stated before, is the highest of the mountains perceived from the Abrolhos. The chain it belongs to runs nearly S. E. and N. W. The southern part of this mountain seems as if a large square tower had been built on its top. Viewed from

* From the Journal of the Geographical Society.

the east, Mount Pascal appears of a conical shape, and being the highest of the whole, it cannot be mistaken.

The shore from Villa Prado up to Mount Pascal runs N. 10° E. It is low, woody, and its general appearance is very much like the shore between Itacolomis and Mount Pascal; it differs only in its yellow red colors. This red color increases more and more towards Porto Securo, and the shore more high, and steep, and the cow tree is more numerous amongst the trees which cover the land. If going along the coast you will pass in succession the bars of Gramminuan, of Josima, of Frade, the small bay of Trancoso, and the church of Mossa. In Senhorada Judea, distant only two miles from Porto Securo, the walls of that church being perfectly white, it is perceived amongst the trees at some distance; there is a small river which empties into the harbor of Porto Securo; on the bar there are 18 feet at high water, and only 11 inside; moreover, there are many banks, extending very far; taking the whole together, Porto Securo is not a good place for vessels of small size, and of no use for large ones.

From Porto Securo to Rio Grande, there are twelve leagues distance; the coast runs N. 14° E., very woody: sandy banks and shallow water are to be found at three miles distance. A new city, called Belmonte, stands on the southern bank of Rio Grande; there are but two fathoms of water on the bar.

From Belmonte to Fort St. Georges dos Ilheos, there are twenty leagues distance, steep shore and equally woody; depth of water from seven to twenty fathoms: and at 5 miles distance, muddy bottom and broken madrepore. At half the distance from Belmonte to Fort St. Georges, you meet the Seras de Itaraca, a group of mountains on which terminates the flat country beginning after Mount Pascal; the southern mountain bears the name of Commandatuba, from which the small river derives its name. From thence up the Bay of All Saints the coast offers the finest prospect, being well cultivated in the valley, and the small hills covered with wood.

From Fort St. George, up to the two Castelhanos Ends, 19 leagues distance, the coast is perfectly secure; the largest ships may approach it within two miles, without the least danger.

The Dos Castelhanos Ends, belong to a high land joining to Ponta de Muta, at the extremity of which stands the small island of Quipe. The Muta Point and the island of Quipe form a kind of basin, into which empties the small river Acarahi, at a short distance from the small town of Camamu. The breakers which obstruct the bay, do not permit vessels to go into it.

Beginning at this place the coast seems divided into two, and appears like two islands. This appearance is produced by the low land existing between the two hilly parts, and remains the same till you arrive at Cape or Morro San Paulo.

Morro San Paulo, from the east end of the bar of Uha's River, may be very easily distinguished, though not very high, being higher than the highland, which stands on its rear, in the northern direction; there are on its top two separated groups of cow trees, very apparent. Morro San Paulo offers this particular, that when near it, the green verdant color of its top seems spotted on the northern side with large white stains: in fine weather these white stains may be seen from 54 miles distance. Two miles east of Morro San Paulo there are 17 fathoms, with good muddy bottom. North of San Paulo the coast is low, sandy, and a reef of rocks runs along within a short distance of it. This coast appears at first connected with the Island of Tamarica; but the land on this island is higher: the space between the western side of Itaporica Island and the main land forms what is called the false entrance of Bahia. This channel is very crooked, narrow, and too difficult to admit vessels to pass.

A vessel may steer in a straight direction from Morro San Paulo to Cape St. Antonio; but if the wind blows too strong towards the land, it is better to keep a little more to the N. W., until the eastern point of Tamarica Island stands north of you.

Description of the Mountains and other objects which show your approach to Rio Janeiro.

At the eastern end of the beach of Maranbaya stands the large point of Guaratiba, where begin the high mountains which surround the Bay of Rio Janeiro. From this point, in clear weather, the Island Redonda (Round Island) can be seen, although 8 leagues distant. That island stands at the entrance of the Bay of Rio Janeiro, and is easily distinguished by its round shape, and by the green and white color of its shores. From the same point, the mountain called the Gabia, or Main-top, which by its peculiar shape cannot be confounded with any other, and is, by this reason, the surest mark for Rio de Janeiro. When arrived near Round Island, there is not the least difficulty in reaching Rio Janeiro. It is unnecessary to undertake the course towards that place, unless you are sure to reach it before night-time, and for that to wait for the sea breeze, which generally begins at 12 or 1 o'clock.

Some say that it is better to make land near Cape Frio, when bound for Rio Janeiro; though it will do well for vessels coming from the north or east, yet in every other instance it will be wasting time.

The Grand Island, the Morro Maranbaya, and particularly the Main-top Mountain, are the surest guides for nearing Rio Janeiro, as they may be seen at a great distance, and no fear in nearing the land.

There is something peculiar which distinguishes the appearance of the Bay of Rio Janeiro from every other place. When coming from the E. S. E. up to the S. W., the tops of the mountains bear a perfect resemblance to a man lying on his back, in a direction W. S. W. and E. N. E., the Mount Main-top seeming to form the head, and Mount Sugar-loaf the extremities of the feet.

The Main-top Mount is flat on its top, and seems not so large at its base as at its top, from whence it derives its name. Eight miles distant from the mountain lies the Paoofasucar (Sugar-loaf) Mount, a large rock, which, although generally indicated as the best mark to ascertain the Bay of Rio Janeiro, is not so, according to my observations, being not so high, so distinct, or so near the shore, as the Main-top Mount. It offers this particular, that its shape is very conical, and it appears above all the other mountains of a like shape around it, and it seems to incline a little towards the N. W.

It is very prudent to keep at some distance from the shore, when navigating between Rio Janeiro and Cape Frio, because the sea breeze blows generally towards the shore, and in like manner the waves generate a current, having the same tendency, particularly when it blows from S. W., and then in case of a sudden storm there will be some danger in the anchorage, not being there very safe.

We must repeat that it is very prudent never to approach too near the islands which stand at the entrance of the Bay of Rio Janeiro, except in case you are certain to reach the harbor during day-time; for if engaged amongst them you may be dangerously situated, in case of a squall of wind, which is often the case; then if not enabled to reach the harbor in day-light, it is better to put to sea again.

Directions for going in and out of the Harbor of Rio Janeiro.

To enter the Harbor of Rio Janeiro it is preferred generally to pass between the Island Rasa* (Bare Island) and the Island of Para, (Father and Mother,) the first one nearly 7 miles from the Sugar-loaf, the two last 5½ miles N 41° E. of Bare Island. They have bold shores, and may be approached very near; and even if necessary a vessel can pass between them and the shore. The depth of water between these islands is from 13 to 23 fathoms. Standing one mile abreast of Bare Island, you must perceive the western end of the most western island (Paya) N. 47° E. from this point. Direct your course during 7½ miles N. 5° E., until you arrive at 800 yards west of the fortress of Santa Cruz, situated at the eastern extremity of the entrance.† During that course you will have passed on your larboard hand several small rocks and small islands, which lie between the Round Island and the land on the Main-top Mount side, and you will pass at one half mile distance from the small island Toucinho, (Ham Island,) which is not far distant from the Sugar-loaf Mount. There is not the least danger. You have only to keep at a proper distance from the rocks which are to be seen. The least depth of water is 7 fathoms at the entrance; but when in the harbor it increases very fast, and at a few yards from the Santa Cruz Battery there are over 12 and 16 fathoms.

The way we prescribe to go into the harbor possesses many advantages. First, it enables you to approach the Santa Cruz fortress sufficiently near to answer the questions put to you by the guard; second, to keep the ship at a reasonable distance from the flat island lying in the middle of the entrance, on which is built the Fort Lage; and thirdly, to correct the effect of the current, which sets towards the N. W. with the tide.

The passage between Fort Santa Cruz and Fort Lage is the only one used in passing, and the one formed by San Joao Point is never used; not on account of deficiency of water, but because it is narrower, more crooked, and the bottom being rocky, is not safe, in case of necessity, to anchor. They say the passage through it is prohibited.

When at 600 yards distant west from Fort Santa Cruz, the course to reach the best anchorage is N. 35° W., until you arrive E. N. E. of Fort Villegagnon, which you may pass at only 600 yards distance. From that place you will steer towards the Island dos Ratos, (Rat Island,) and now, being in sight of the city, you may choose your anchorage in from 10 to 20 fathoms.

If you draw a line from the flag of Fort Villegagnon to the Cobras (Snake) Island, that line will separate the anchorage for vessels of war from that of the merchant vessels. The best for vessels of war is towards the E. N. E. of the palace, and south of a line drawn from Rat Island to the main church in the city, and the best for merchant vessels is near the city. The largest reach that place by passing north of Snake Island, and they are separated from the vessels of war by a bank, or shallow water, where boats only can pass, and over which the sea is constantly breaking at low water.

The sea and land breezes are regular, and each last one half of the day. The land

* On Rasa Island there is a light-house with a revolving light.

† A fixed light is exhibited on the fortress of Santa Cruz.

breeze begins in the evening, continues during the night, and stops at nine or ten in the morning; a calm of one hour generally succeeds it, and at about eleven the sea breeze commences.

Vessels going to sea will follow the course opposite to that pursued when going in. It is best to take your departure in the morning, in order to take advantage of the land breeze, which, lasting 3 or 4 hours during day-light, enables you to clear all the small islands, and reach the open sea. Vessels used sometimes to go at some distance from the city the day previous to their departure, in order to have a better chance of getting to sea the day after, with the land breeze. In case the breeze should subside, it would be better to cast anchor.

Description of the Coast comprised between the Island of St. Catharina and the Bay of Rio Janeiro.

VOLAGE BANK, on the coast of Brazil, lat. 26° 44′ S., long. 48° 15′ W. Soundings 12¾ to 14 fathoms.

His Majesty's ship Volage, on her way to St. Catharine's, on the coast of Brazil, in September, 1832, struck soundings in 14 fathoms, mud, on a bank which is not laid down on the charts in the above latitude and longitude, calculated from the noon observation. From thence, while the ship was sailing two miles west by south, bottom was found with 14 to 12¾ fathoms; after which, on steering W. and W. S. W., the water deepened suddenly to 23 and 29 fathoms; and these depths were preserved until the Island of Arboredo, at the north end of St. Catharine's Island, was passed.

The above position of the shoal depends on that of Fort San Jose, which was considered to be in lat. 27° 26′ 30″ S., and long. 48° 39′ W. The variation was found to be 7° easterly. Roussin passed inside of this shoal, and does not lay it down.

FROM RIO JANEIRO TO THE RIVER PLATE.—On quitting Rio Janeiro, the shore bends W. by S. towards the great point of Guaratiba, where the range of mountains terminates which surrounds the Bay of Rio Janeiro. From this point you may in fine weather clearly perceive Redonda, or Round Island, distant 8 leagues, which island is distinguished by its form, and the deep streaks of white and dark green which slope down on every side. You will also discern La Gabia at the distance of 6 leagues, bearing E. N. E., which is a remarkably formed mountain, as already described, and cannot well be confounded with any other. It therefore is the most certain mark for Rio Janeiro, particularly when coming from the southward.

From the Point of Guaratiba, a W. S. W. course will lead along the low land of Maranbaya, the western point of which terminates in a little hill, called the Morro de Maranbaya, at the entrance to the Bay of Ilha Grande. The eastern point of the Praya de Maranbaya, or Maranbaya Island, is separated from the land of Guaratiba by a small channel, which boats only can enter. This island occupies a space of 8 leagues E. and W. It is very low, and you must not approach it without the greatest caution, especially when the weather is not clear. This circumspection is the more necessary on account of a rock, surrounded with shallow ground, which projects 3 miles to the southward from the coast, about midway. By keeping about 4 miles from the coast at this part, you will have from 22 to 30 fathoms water, with a bottom of sand and gravel.

BAY OF ILHA GRANDE.—The great Bay of Ilha Grande, formed between the continent and the island of this name, has two entrances. The western one is bounded by the Point of Joatinga and the Island of Grande; the eastern one by the same island, and the promontory or low land of Maranbaya. Either of these entrances conducts you into the bay, which is calculated to receive the largest vessels. The pilots say "whole fleets may enter there, and find shelter from every wind. The soundings vary from 30 to 7 fathoms in the greatest part of the bay, and you may readily procure wood and water from many parts of the coast."

At the distance of 2 miles from the south part of Ilha Grande is the little Island of Georgi Greco, which has a barren appearance, but will furnish you with both wood and water. The largest vessels may find anchorage on its northern side, and refreshments may be procured at the little village of d'Angra dos Reos, which is there situated.

It does not appear that Baron Roussin penetrated into the interior of the Bay of Ilha Grande; and the information Europeans at present possess of this bay is very imperfect.

This bay is bounded on the N. E., and also on the S. W., by the main land, comprehending a length of full 60 miles, and is studded with numerous islands and places of anchorage, having many villages on the northern shore. The Eastern, or Maranbaya Channel, leading into this bay, is 8 miles wide, and may ke known by the single bold mountain about 700 feet high, which stands on the low point of Maranbaya. The sandy flat, or Island of Maranbaya, is about 20 feet above the level of the sea. In most parts, especially near the middle of the island, it is quite barren; in others it is covered with various creeping plants, which keep the soil together. It exhibits on its summit a little brushwood, and at its northern extremity some mangroves. Towards the sea it is steep, and the surf breaks with violence against it; but towards the bay it is level and smooth.

This latter side abounds with shell-fish and sand-larks. The herbage shelters many armadilloes, and there are numerous deer and other animals of chase. There is a church, and some few springs of good water.

The Island Grande, which bounds the western side of the channel, is 14 or 15 miles in length, and lies in the centre between the two channels. The Western, or Gairoso Channel, is three leagues wide, and both channels have deep water within them. On entering this passage there are said to be several small bays at the western shore; and in entering the eastern channel there are also the Bays of Palmas, Albroo, and Eschella, all situated on the eastern side of the Isle of Grande. Palmas Bay is reported to have good anchorage, inasmuch as a vessel may lie land-locked within it, and ride in 6 or 8 fathoms water. The other two are smaller, and have a depth of 5, 6, and 7 fathoms.

The following directions are from the journals of Mr. Bruce, Master of H. M. ship Diamond, in 1826:

"The western channel between the Ilha Grande and Joatinga Point may readily be known by a remarkable hill inland, called the Friar's Hood; this you should endeavor to bring N. by E. ½ E., and then steer towards it until you get within 2½ miles of the point. Keep at this distance from the island, in order to avoid the sunken rock, which is laid down in the chart about mid-channel: we kept about 2 miles off, and saw a great number of islands over towards the main. After passing Starling Point, we perceived a low and barren island, lying about 1½ mile from Ilha Grande; this we left on the starboard side, carrying 9 and 10 fathoms close to it. We then discovered what is called Terville Island, and also the town of Villa Grande; steered for the Island Terville, and had no where less than 6½ and 7 fathoms. Green Island lies so very close to Vilha Grande, that until you get close to it, it cannot be distinguished as an island. We left this on the starboard side, and Terville Island on the larboard, and had 9 and 8 fathoms between them; kept close to Ilha Grande, until Gabia Grande was distinctly perceived; then steered towards it, gradually deepening our water to 12 and 13 fathoms." Mr. Bruce observes, "I have no hesitation in saying the whole of these islands are laid down too far to the westward in all the charts; for, if they had been correctly delineated, we must have seen Barren Island, Elam and Green Islands, the moment we rounded Starling Point; instead of which, they were not visible until we had passed Vermeille Point, so that they must be nearer to Eschella Point. We rounded close to the Island Gabia Grande in 9, 10, and 11 fathoms, and then steered for the cluster of islands which lies round Jagesons, or Jagenos Island, and came to for the night in 14 fathoms, sandy ground, the extremes of the islands bearing S. E. and N. E. by E., distant 1½ mile from the shore. We passed through between the islands Fortada and a small low, round, and well wooded one, which lies nearly west, distant 2 miles from the former, in 16 and 17 fathoms water. This is a very safe passage with a leading wind; but due east from the woody island a dangerous reef runs off about the length of 3 cables, upon which are only 12 feet water: this, therefore, must always be carefully guarded against.

"The best, most common, and by far the safest passage to Sapatiba, is by keeping the main land on board, leaving the whole of the Islands of Tacurucu and Madeira on the larboard side, and those of Jagenos on the starboard: you will then have 10 and 9 fathoms of water until you get abreast of Madeira: it then gradually shoalens towards the anchorage of Santa Cruz, off which we anchored, with the following bearings: Madeira Island W. by N. ½ N., distant 2½ miles; Tacurucu Island W. by S. ½ S.; entrance of Tagua River N. W. ½ N., distant 1½ mile; Mount Maranbaya S. W., and Point Sapatiba E. by S. ¼ S., in 5¾ fathoms, muddy ground.

"In sailing from hence, we kept the main land on board, and when we were between the Islands of Gabia Grande and Fortuda, caught a westerly wind. You may stand towards Gabia Grande into any depth you choose; but you must be cautious in approaching the shores of Maranbaya. Stand not into less than 10 fathoms, lest you get upon the reefs on that side; you will have 15, 17, 10, and in two casts only 5 fathoms; then, before you get the ship round, you will be in 4 fathoms: with the above soundings, Gabia Grande bore N. N. W., and Point Maranbaya S. by E. It appears by the water having shoaled gradually when standing towards the reef, from 17 to 15, 10, and 7 fathoms, that the western edge of it lies with Point Maranbaya S. E. ½ E., and Gabia Grande N. E. ½ N.

"The Maranbaya, or Eastern Channel, is upon the whole very safe, and may be navigated, with common prudence, with very little danger. Should the winds be light when you get within Point Maranbaya, and the flood or easterly current is making, you should not bring Gabia Grande to the northward of N. E., or N. E. ¼ N., for the tides set strongly over Maranbaya Reefs, and there are plenty of places for anchorage."

Point Joatinga, which is the western point of the Gairaso Channel, has a small islet before it. This island, according to Baron Roussin, lies in 23° 18′ 30″ S., and longitude 44° 39′ W. This point, with that of Cariocu, terminates the southern part of the high

land which forms the vast Bay of Ilha Grande; both are very lofty, and may be approached with safety by all sorts of vessels.

From Point Cariocu the land runs W. 23° S., about 9 leagues, towards the Islands of Porcos: this group comprehends an island somewhat high, and is accompanied by three other smaller ones; one of these lies to the southward, the others to the eastward. The pilots assert "that between this island and the continent there is a very fine channel, through which large vessels may pass, and anchor in perfect safety. You may, at many parts of the coast, procure wood and water, also cattle and other necessaries; but you should not attempt this passage without having the advantage of a fair wind."

Mr. Bruce says, "When I was near the shore about the Island of Porcos, I took the following bearings of a very interesting *cluster of islands*; between the whole of which there appear to be good and safe passages, with excellent anchorages inside, sheltered from all winds. The Island of Porcos bore S. W. ½ W., distant 12 miles; the first, or in-shore *island* about half a mile from the main, and situated abreast of a very fine sandy beach, N. by E., distant three-quarters of a mile; second *island* N. E. by E., distant 1 mile; a rock, which is 10 feet above the level of the sea, E. N. E., distant 1¾ mile; and an island, which appeared to be 2½ miles in length, and forming a sort of cape to this little bay, E. by S., distant 3½ miles; with 6 smaller islets inside of it, running to the N. eastward in a semi-circular form.

Mr. J. Engledue, of H. M. ship Bedford, observes, "The bay in Porcos Island shows a good roadstead, being sheltered from all winds, except those from the N. E. to the E. by N., which seldom continue long enough to occasion a sea of any consequence; it may therefore be considered the best and safest of any on this part of the coast. There is no regular tide, and the water does not rise or fall above 1 foot. Shark's Road also has good anchorage with all winds except those from the southward, which occasion a heavy tumbling sea, and render large vessels unsafe."

SAINT SEBASTIAN'S ISLAND.—Point Pirasonungo,* which is the S. eastern point of the Island of St. Sebastian, bears from Redonda Island W. S. W. ½ S., distant 40½ leagues, and from the Point Cariocu S. W. ½ S., distant 49 miles. It is about 4½ leagues in diameter, and the mountains are as lofty as those upon the main land, from which it is separated by a narrow channel. This island is visible 15 leagues off in clear weather: the shores are very steep, the south point projects sensibly, and the coast turns directly to the E. S. E. so far as the S. S. E. point of the island. The eastern coast runs nearly in the direction of the meridian. The whole island is in the form of a triangle, and the coast opposite to the continent forms with it a strait, or channel, with deep bays, where you will find excellent anchorage on a bottom of mud, having from 25 to 8 fathoms. "While mentioning the qualities of the soundings," says the Baron, "I may observe that on the coasts of Brazil, muddy ground is most always to be found near the highest lands."

Many islands, or groups of islets, situated to the northward of the Island of St. Sebastian, contribute to shelter the vast basin which the island forms with the continent. The most contiguous is the Island of Victoria. Six miles E. 28° N. of Victoria, are the three little Islets of Buzios; and 11 miles N. 15° W. of these lie the Porcos Islands, already noticed. The passages between these islands have water sufficient for the largest vessels, like that between the Island of St. Sebastian and the main: however, the passage between Victoria and St. Sebastian's being contracted by a reef, which stretches 2 miles to the S. S. W. of the former, it is somewhat hazardous for large vessels to pass through it.

THE STRAIT OF ST. SEBASTIAN is formed between the island and the continent, and offers a safe and commodious port for the largest vessels: its general direction is N. 30° E., and S. 30° W., but this course cannot be followed exactly throughout the strait, on account of the banks which run out from the continent two-thirds of its length from north to south. Vessels coming from the northward, and leaving a point situated half a mile from L'Armacao, which is built at the head of the north-west side of the island, should first proceed S. 16° W., for about 5 miles, and then S. 45° W., until they get out of the strait. In this passage, which is about 11 miles in length, the least water will be 10 fathoms, but more frequently from 15 to 20 fathoms, the ground being always of mud, which holds well. The greatest breadth between the island and the main is about three miles, and this is at the northern entrance; but two-thirds of this space is occupied by the banks just mentioned, over which there are not above three fathoms water; so that you must range along the shore of St. Sebastian's Island, at the distance of 500 or 600 fathoms.

The southern entrance is much narrower: nevertheless, all the natives assure you that the largest ships may navigate it, by only following the direction of the channel. You could not wish for a harbor more tranquil than this of St. Sebastian; for, environed by high land, the vessel rides on water which is as smooth as though it were in a basin.

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* This point, according to Baron Roussin, is in latitude 23° 57′ 32″, and longitude 45° 20′ 18″ W.; but Captain Heywood, in 1810, made it only in longitude 45° 9′ 30″.

You will find at St. Sebastian the advantages of a good supply of cattle, poultry, arrack, and other provisions customary to the countries situated within the Tropics. You may obtain these very easily, and at moderate prices, either at the two principal establishments, or at the habitations of the natives, which are scattered about in great numbers in the interior of the coast. Fish are seldom very plentiful, but they are of a good quality.

The ancient town of St. Sebastian is on the continent, at the narrowest part of the strait. Since 1817 the Brazilians have projected another, to be called Villa Nova da Princeza, situated near the north entrance on the island. It is 400 fathoms S. W. of this new establishment, where there is the best anchorage for men-of-war, having 17 fathoms water, on a bottom of grey sand. There are a great many watering places on the Island of St. Sebastian: one of the best is at the entrance to the new town and L'Armacao, situated at the N. W. point of the island, where water is good and easily obtained. Wood for fuel may also be had on all parts of the adjacent continent.

The winds at St. Sebastian follow, almost always, the direction of the strait, except at night, when the land breezes blow alternately from many points, without following any regular law. During the day the winds generally come from the N. N. E. and the S. S. W., following the direction of the land; but are frequently interrupted by intervals of calm.

The currents follow the same directions as the winds, and their velocity is proportionate to the force of the latter; the most common in the straits, is from $\frac{7}{10}$ of a mile per hour, to $1\frac{8}{10}$ of a mile.

The tides have no regularity within the strait; nevertheless, we thought we could reckon that it is high water, on the days of new and full moon, at 2 o'clock. The rise of the tide has been estimated at 4 feet.

The anchorage is situated in latitude 23° 47′ 26″ S., and in longitude 45° 27′ W. The variation was 3° 25′ E., in June, 1819. We have observed that the land of St. Sebastian's Island, and that of the neighboring parts, is much elevated; the hills are covered with wood up to their summit, and have a most agreeable aspect. The coasts are steep, and you may anchor any where at a little distance from them, on a good bottom; and there is, in general, no danger but what appears above water.

About W. S. W. $\frac{1}{2}$ W. from the southern entrance of the Strait of St. Sebastian is that of Santos, the distance being nearly 50 miles. Between them you will perceive the deep bay which forms the coast, and also a number of islands near the shore, of which the Monte de Trigo, (Stack of Corn,) is the most considerable. The Monte de Trigo is nearly conical, high, and woody to its very summit. At 2 or 3 miles from it, as well as at the same distance along the neighboring coast, you will find a good passage with from 12 to 25 fathoms, on an excellent bottom of mud. Due east from this island, at about 14 miles distance, is a small rocky islet, called Toquetoque; it lies just off the western entrance of the Strait of St. Sebastian; and in coming out or going in, should always be left to the northward. Some small rocky islands also lie close to the shore, and to the N. E. of Monte de Trigo.

LES ALCATRAZES.—The group of Alcatrazes is composed of several barren rocks above water, the largest of which may be seen 7 leagues off. Viewed from the E. S. E. it has the appearance which painters commonly give to the dolphin; whose head, joined to two little rocks, is turned to the W. S. W.; another rock, larger than the two latter, lies at the distance of 2 miles to the W. N. W., while 2 or 3 others are situated about a similar distance to the north-eastward. The pilots say the bottom is not safe in the parts adjacent to this group of rocks, and that it will be prudent not to approach them nearer than 4 or 5 miles, and that with a fair wind. This precaution may be rendered necessary by the vicinity of the Strait and Island of St. Sebastian, which cause the currents to be very considerable at this part. Mr. Bruce asserts, that vessels beating to windward from Santos, may pass close to the Alcatrazes, which are steep to, and visible 10 or 12 leagues off in clear weather.

The summit of the principal island of the Alcatrazes is in latitude 24° 6′ 5″ S. and in longitude 45° 46′ 32″ W. The variation in 1819, was 5° E.

It will here be proper to mention a rock first seen by Manoel Madeiros, a Portuguese commander, on the 13th of February, 1811, who sounded round it at 100 fathoms' distance, and was unable to reach the ground. He entertained no doubt of the real existence of this danger, and described it to be a round naked rock, sometimes above water, and often covered by the swell of the sea. The mariners of Brazil seem to allow the reality of this danger, which is said to lie 35 leagues S. by E. from the S. E. point of St. Sabastian, and 72 leagues E. 29′ N. from the N. E. Point of St. Catharine's Island; or in lat. 25° 41′ 20″ S., and long. 44° 59′ W. from Greenwich.

Baron Roussin observes, this danger appeared nearly in a similar situation on two M.S. charts of the Portuguese, then in his possession; and therefore he thought it ought to be placed on all maritime charts in future.

W. $\frac{1}{2}$ N., distant 11 leagues from the Alcatrazes, is the Island of Moela, upon which

a light-house is erected.* The island is situated off the eastern point of the Harbor of Santos.

SANTOS.—The Port of Santos was formerly much frequented by Portuguese vessels, but is now only of secondary importance: for the riches of the provinces of Rio Janeiro, Bahia, and Pernambuco, acquire every day a predominance more considerable than all the southern provinces. This port is formed by the continent and the Island St. Amaro, being only separated from the former by the little River Bertioga. There are two entrances, but only that of the south is navigable by large vessels; for the other, formed by the River Bertioga, is only fit for small craft. The Harbor of Santos will admit large ships, which may ride sheltered from all winds, except those from the S. S. W. to the S. E.

The Point of Taypu, which forms the western point of the entrance, is in lat. 24° 1′ 11″ S., and in long. 46° 30′ 20″ W. The Point of Manduba is to the eastward; and on the same parallel, about a mile to the south-eastward of which is the little Island Moela, which may be approached without danger.

The following directions are by Mr. Bruce, whose name has frequently been introduced in the course of this work.

"In steering for Santos from the southward, you may pass close to the Island Redonda, (the Queimada Grande of Roussin,) bearing N. E. ½ N., distant 1 mile; it is 2 miles long, and narrow, and lies about N. N. E. and S. S. W.; the highest part is to the S. W. which appears lofty and bluff, and, with the above bearings, seems to be round. N. W. from this island is another, distant nearly 6 miles; this is small, and quite round, being thickly wooded, and visible 20 miles off. After passing between these islands, I perceived a rock 12 or 15 feet high, and a little larger than a line of battle-ship's launch; (neither of these two last appear in the charts.) The following are their bearings and estimated distances:—Large Island, perhaps Redonda, S. E ½ E., distant about 6 miles; small round Woody Island, S. W., 2½ miles; and the Rock, N. E. ¾ N., about 6 miles; the Rock in one with Redonda, S. ½ E.; Rock and Woody Island in one S. W. by S. When going into Santos Bay, I took the following bearings: Bird or Duty Island, (the Laage de Santos of Roussin,) S. E. distant 4 leagues; Alcatrazes, E. ¾ N. 12 or 13 leagues; supposed Redonda, S. W. ¼ W. 10 or 11 leagues; and Point Engenho, north, nearly 9 miles; at this distance we could not see either the Woody Island, or the Rock.

"In advancing into the River Santos, you will have 10, 9, 8, and 7 fathoms water, until you near the bar, upon which there are only 4½ and 5 fathoms: the entrance is narrow, but the starboard side is much the boldest, and has 19 fathoms water close to the shore. After passing the first Barra Grande, the water deepens to 15 and 16 fathoms, within 12 fathoms of the shore. Keep the starboard land close on board, until you get abreast of a few huts: then steer mid-channel, keeping gradually on towards the highest or northernmost hill, there being two on the westernmost bank of the river, and these are the only ones, therefore you cannot be mistaken. Steer from the huts before mentioned towards these two hills. The reach is shallow, with not more than 3 fathoms on it; there the starboard side will be found the shoalest; keep therefore close to the hills, and your water will deepen to 6 fathoms; but having passed the hills, you may again run toward the starboard shore, and when you have passed about 2 cables' length, then steer for the fort on the starboard bank of the river. This is erected upon a perpendicular rock, close to which are 20 fathoms water; and when you arrive abreast of this fort, you will see the town of Santos nearly open of the point on the larboard side. Steer towards it, keeping about 2 or 3 cables' length from the shore, and you will then avoid the shoal which runs from it, and be perfectly clear also of the bank which runs off the fort in the direction of the town, on the starboard hand, and when almost up to the town, you can anchor. The best anchorage will be abreast nearly of the centre of the town, in 7 fathoms, on a bottom of mud. Provisions are abundant, and good water may be obtained by sending a boat about 7 or 8 miles further up the river.

"To enter this port a pilot is not absolutely necessary: for the above directions, if well attended to, will be fully sufficient to carry you in, clear of every danger. When you get abreast of the town, you will observe the high land opposite, on the northern side of the river. You may pull towards this, and round Carvallo Point pretty close, by which you will open the Lago de St. Rita. This lake is about four miles in circumference. Steer right up it for the distance of a quarter of a mile, and stretch directly over for a low round island, thickly covered with brushwood; and when you get near to this, you will perceive another island, somewhat similar in appearance. Keep nearer to the first island, and pass between them: then you will open the entrance of the river, and also will observe another branch or opening on the starboard side. Keep the larboard shore on board, and pull up about 3 or 4 miles. You will then find the water freshen. A boat may with ease make two trips a day; but as the atmosphere is hot and sultry, all boats should endeavor to get on board before half after 3 o'clock; for at this

* This light-house shows a fixed light, and is of great assistance in entering this port.

time it commonly begins to rain, and continues to do so until 10 at night. Wood is in abundance.

The Barra de St. Vincent is on the west side of the entrance to the Port of Santos, and was once a good channel; but the continual increase and accumulation of sand have choked its entrance up, for now it will scarcely admit canoes to pass.

Le Laage, or Rock of Santos, lies 16½ miles S. 14° E. of the Island Moela; it is a smooth white stone, elevated about 6 or 8 feet above the surface of the sea; it lies in latitude 24° 18′ S. and in longitude 46° 17′ W. Midway between this danger and the Port of Santos, there are 19 and 20 fathoms, with a bottom of sand and mud, which is the usual quality of the ground hereabout.

Leaving the Port of Santos, the coast runs S. W. towards the Village of Conceicao, a distance of 8 leagues. The land is generally low at the water's edge, but high in the interior; for a chain of mountains runs along 4 or 5 leagues inland, and the shore is intersected and broken by several rivulets, which, in sailing along at a distance, gives to it the appearance of islands. This chain of mountains is broken by the Harbor of Santos, but continues to run E. by N. so far as the Harbor of Sebastian.

The Village of Conceicao is situated on a little mountain near the shore, 4 miles off, where you may anchor in 10 or 12 fathoms water. To the S. W. of Point Taypu, distant 20 miles, is an isolated rock, elevated about 10 or 12 feet above the surface of the sea, which the Portuguese call Laage de Conceicao, at a pistol-shot distance from which are from 12 to 14 fathoms, sand and mud. Off this part you may distinctly perceive the port of Santos. This rock lies 7 miles to the E. 31° S. of the Village of Conceicao, and 15 miles to the N. 4° W. from Queimada Grande.

The Islands of Queimada are two masses of rocks, nearly barren, and distant from each other 10 miles, in a S. E. and N. W. direction: the largest, which is farthest to the S. E., and may be seen 7 or 8 leagues off, has a little rock lying to the northward of it; you may, without danger, go between the two Queimadas, or pass between them and the land.

In sailing along the shore to the south-westward, you will recognize successively the River and Hill of Piruibe, the two Isles of Queimada, the Isles of Guarahu, the Barra de Unha, the Point da Jurca, and the River Iguape. At the distance of from 3 to 10 miles off the land, you will have a depth of from 8 to 15 fathoms. The coast near the shore becomes rather high, and runs in the direction of S. 50° W., and the soundings opposite increase in proportion to the elevation of the adjacent coast.

IGUAPE AND CANANEA.—The coast, from the entrance of the River Iguape to the River Cananea, is called the Playa de Iguape; it is a low sandy flat, except about the middle, and cannot be seen unless you are a very little distance off; therefore, in sailing along it, you ought never to come nearer the land than 2 leagues; nor into less than 10 or 12 fathoms water, with a bottom of sand. This Playa de Iguape is separated from the continent by a lake, or natural canal, which communicates with the Bar of Cananea, and is called by the Portuguese, Mar Pequina, or the Little Sea. This lake has depth sufficient for large vessels, but the Bar of Iguape will only admit of boats. You must not confound this opening with the Bar of the River Iguape, which is situated 3 leagues further to the north-eastward, and forms the entrance of the River Iguape, situated in latitude 24° 35′ S.

You may anchor all along this coast at the distance of 2 or 3 miles off the Playa, on excellent muddy ground, with from 6 to 10 fathoms water; but there are no ports on this coast accessible to large ships, and there can be no necessity to anchor here, unless in a calm, when you have no occasion to expose yourself to danger.

After passing along the Playa de Iguape, you will arrive at the Bar of Cananea, and at the Island of Bom Abrigo, which lies to the southward of the Bar of Cananea, within which the Brazilians construct their large vessels; and the natives say, that to enter the river, "you may pass with a pilot to the southward of the Island of Bom Abrigo; but the common channel is to the northward, although it is encumbered with many shoals." The Island Bom Abrigo is very high, and covered with trees: and vessels may anchor at a little distance off to the eastward. There is a little island lying to the southward of it, about 2 miles to the eastward from which there are 11 and 12 fathoms water, on a bottom of sand.

The Bar of Cananea may be known from seaward by two objects, both equally conspicuous; one is the Mountain of Cardoz, situated inland, about 5 leagues W. N. W. from Bom Abrigo; the other is the Playa de Iguape, or flat, consisting of little downs of white sand, interspersed with brushwood, which extends all the way from the Bar of Iguape, a distance of 10 leagues. Notwithstanding the short distance, and the height of the chain of mountains, of which Mount Cardoz constitutes a part, and predominates so remarkably, the fogs that prevail throughout this part of the coast in the south monsoon, will prevent your discovering the land, and large vessels should therefore approach the low coast with the greatest precaution. Mount Cardoz is the highest mountain

upon this part, and is situated in lat. 24° 54′ 45″ S., and in long. 48° 12′ 26″ W. The variation, 6 leagues off the land, was 7° E. in 1819.

Pimentel, in describing this part, proceeds thus:—"From the Barra de Iguape to the Barra de Cananea the distance is about 30 miles, the shores being low and flat. Opposite to the entrance to the latter, lies the Island Abrigo, dividing it into two channels, both of which are dangerous, on account of the breakers and shoals thereabout. The northern entrance, called Barra Falsa, is narrow and shallow. Corvettes and small boats only enter there. The southern entrance is wider and deeper, and in this channel ships of burthen find a passage. Sail in towards the southern shore, keeping close in 3 and 4 fathoms water; but observe the bar is shifting, and consequently dangerous to all strangers. The bar is about a mile in breadth. When you are within you will deepen your water to 5, 6, and 7 fathoms, and may anchor as most convenient for your purpose.

From Cananea southward, you will fall in with a small island, called Castillo. This is nearly opposite to the River Arrepira, which is now not navigable. Further on is Figuera, another small island; and coasting along, you will reach the Barra de Superagui, admitting canoes only. This creek is divided from the main entrance to the Bay of Paranagua by the Island of Pecas, near a mile from the southern part of which are some rocks. These rocks form the northern boundary of the channel, while the Island do Mel lies to the south. The passage between is near a mile in width. A league off at sea are only 3½, 4, and 5 fathoms; but as you approach the bar, it deepens to 5, 6, 7, and 8 fathoms; in the channel are 4½ and 5 fathoms; and when within you will have 5, 6, and 7 fathoms. There is another entrance to the southward of Mel Island, called Barra do Sul; but, like the Barra de Superagui, it is fit only for boats. The course to Paranagui Town and the Villa Antonina is due west. The former is on the larboard side, almost 4 leagues from the bar, while the latter is rather to the northward, and about 6 leagues up the river. There are several islands scattered about, but the channel is generally clear, and every known danger is visible."

Roussin says, that in following the land to the S. westward of Bom Abrigo, to the distance of 10 miles, you will meet the little Island Castillo, and 8¾ miles beyond that, in the same direction, the Island of Figo, or Figuera, both which have obtained their names from their peculiar appearance: the former is somewhat less elevated than the latter, but broader, and has a ridge rising up in the middle, which may be mistaken for a castle; the latter resembles a fig. They are both nearly barren, and bear from each other S. 35° W., and N. 35° E. In drawing near to them, you will have, at the distance of 1 mile, from 15 to 10 fathoms, fine sandy ground.

PARANAGUA.—Having passed to the southward of Figuera, about 8 or 9 miles, you will open the Bay of Paranagua. This is a bay of 3 or 4 leagues diameter, receiving many brooks and little rivers: the entrance is sheltered, and at the same time divided into two channels by a low island, upon which are many little hills, appearing, when seen at a distance, like several islands. This island, named Isle do Mel, has on its northeastern side, three little Islets das Palmas. The southern entrance is encumbered with breakers, and not navigable. The northern channel will admit of brigs, and many are built in the bay, which is surrounded by forests. In navigating the northern passage, the pilots say you ought to leave the Islands of Palma to the starboard; these you will recognize by the palm trees with which they are covered, but a pilot must always be employed for the interior navigation.

The water which runs out of the Bay of Paranagua constantly carries with it the alluvial soil of the country, which sensibly is diminishing its depth, but there is otherwise nothing material to obstruct its navigation; and 2 leagues from the two entrances there are from 5 to 9 fathoms water, the bottom being grey sand and mud. The coast from hence to the Island of St. Catharine, generally speaking, runs south.

The summit of the southern hills on the Island of Mel is in latitude 25° 32′ 43″ S., and in longitude 48° 25′ 40″ W. The variation was 6° 1′ E. in 1819.

GUARATUBA.—S. S. W. from the Barra do Sul de Parangua is the Point of Joao Diaz, the eastern point of the entrance of Rio San Francisco; 16 miles N. by W. from which is the entrance to the River Guaratuba, from the northern point of which a paracel, or shoal, runs up to the Barra do Sul; this shoal extends 4 or 5 miles from the shore, and is bounded to the eastward by the little Islets of Coral, and by two great rocks, 20 feet high, called the Itacolomis. The shoal is not navigable except by boats; but you may approach the rocks to seaward to the distance of one or two miles, where you will have from 10 to 12 fathoms water, the ground being sand and mud.

Pimentel says, "The entrance to the River Guaratuba is on the north side, near a large rock, where you will have a deep channel with 6 and 8 fathoms water; but from this all is shoal to the southward. This river is remarkably rapid, and famed for its fisheries. Whoever runs for the harbor from the northward, should keep close to the land, make for the point of the rock above mentioned, and when about to enter, keep the small flat island astern: this island lies about 1½ mile to sea, and your anchorage will be immediately behind the hill to the northward, or opposite to the hill on the south side. This

river is supplied by several others, of which Rio St. Joao is the most considerable, and is said to be navigable for upwards of 12 leagues."

RIO SAN FRANCISCO.—"About 16 miles south from Guaratuba is the northern entrance to the Rio San Francisco, capable of accommodating any vessel, and having from 6 to 13 fathoms in its channel. To sail in, it is advisable to coast up the land which lies to the southward, in 6, 7, and 8 fathoms; and when you arrive at the headland where this coast ends, you should make for the northern point, taking care to avoid a bank running to the N. E., which is shoal, having not more than one fathom at low water; and as soon as this north point comes abreast, stand S. by W. for the town, or for the Church of St. Joze, built on an eminence, opposite to which you may anchor in clear ground. This entrance may be known by the high woody land of San Francisco, which terminates at the hill; and also by the three islets lying two or three miles to the westward of this hill. The other entrance to the river, called Aracary, is six leagues to the southward, and fit only for canoes; but opposite are some islands with anchorage and shelter from the sea, in 4 and 5 fathoms water, on a bottom of whitish sand."

The Islands of Garcia lie on the parallel of the Point of Joao Diaz, which forms the eastern extremity of the Bay of San Francisco, and are situated about 2½ miles from the point. Fourteen miles to the southward of this group of Garcia are the Tamboretes Islands, from abreast of which the coast turns more to the westward, so far as the River Aracary; near the bar, or entrance of which, is another group, called the Remedios: all these islands lie at the distance of 2, 3, or 4 miles from the coast, and are said to have passages between them. The islands are covered with trees; but between the Remedios and the mouth of the River Aracary, the passage is said to admit of small vessels only; and even then it is not to be depended on.

The River Aracary, after running a considerable way up, and separating the Island of San Francisco from the main, turns N. E., easterly, and runs into the sea at a spacious bay of the same name, where you may anchor in several places. At 2 leagues from the shore, N. N. E. from the entrance of Rio San Francisco, you will not find more than 6 fathoms water, on a bottom of fine sand. The coast is flat, the land adjacent but little elevated, but interspersed with desolate spots, which are rather remarkable. A few leagues in the interior are the Sierras of Maratuba, a chain of very high mountains.

Directly south of the Remedios Islands, distant 6 leagues, is the Point Itapacoroya, the eastern extremity of a bay, rather deep, and sheltered by the winds from the south and west; here are an *armacao** and two little rocky islands, near which you may anchor in sufficient depth of water. At the bottom of this bay the land runs N. ¼ E., so far as the Islands Garcia, where you may see another *armacao*, the whole distance being 13 leagues.

S. S. E., 7 leagues and a half from Point Itapacoroya is the Point of Bombas, and between them are the Points of Cambecudo, Camboriu, Ytapeba, and Garopas, forming several bays. You may safely sail along these points at the distance of 2 or 3 miles. Pimentel says, "the entrance to Garopas Bay is 8 or 9 miles broad, and well sheltered from all winds, with depth of water enough for any ship. Two rivers discharge themselves into this bay over beds of white rocks, and the surrounding land is covered with thick woods. To the southward is Point Manduri, from whence you proceed on southerly to the Island of St. Catharine."

Description of the Island and Anchorages of St. Catharine, by Baron Roussin.

THE ISLAND OF ST. CATHARINE is situated at a little distance from the continent, upon the parallel of 28° S.; it is sufficiently elevated to be visible 15 leagues off, in fine weather. At the above distance you will find 70 fathoms; thence the depth diminishes gradually to within 4 cables' length of the coast, where there are 4 fathoms.

In approaching from the eastward, this island appears very uneven, being intersected with mountains and deep valleys: its elevation is greater at the southward than at the northward. Across it the mountains on the continent are a little more elevated than those on the island; and you will distinguish among these principally the Morro de Camborella, which is a branch of the eastern Cordilleras, which extend from Rio Janeiro to this island.

About the middle of the island, and near the edge of the sea, is a large lake, which presents an opening that may serve to distinguish it as a landfall. At three leagues from the eastern coast, if you bring this opening to bear west, the N. E. point of the island will be about 3 leagues to the N. W. All the eastern side of this island is safe, and rather steep to, and you may run alongside many large rocks on the coast without danger.

The Island of St. Catharine may be entirely circumnavigated, and many anchorages will be found between the western coast and the continent; but the northern part of the channel is the only one fitted to receive vessels which draw much water, and it is to this part we shall limit our description.

* An armacao is a building used for the purpose of converting the blubber of whales into oil.

To enter by the North Channel into the Gulf or Bay of St. Catharine's.—The passage most frequented, leading to the anchorage, is between the north point of St. Catharine's and the Arvoredo, a woody island situated N. N. E. from the northern point, called Point Rapa. This passage is rather less than 2 leagues in extent, and does not contain any danger. You may approach it on either side, observing only to keep clear of the Moleques,* which you will leave to the southward: these are large rocks, and lie near the shore. We may say the same of all the points which surround this passage, for you may sail close, and beat up to them without the least risk or danger. There are 26 feet water at 600 toises distance from the N. W. coast of St. Catharine's, which is the deepest water in this part of the channel.

The anchorage for large vessels in the Bay of St. Catharine's.—When you are within the bay, you may anchor any where, agreeably to the size of your vessel; by keeping in the middle of the channel, the depth will be sufficient for the largest ships, to 1000 toises S. by E. off the little Island Anhatomirim. Having passed this point, in advancing to the southward, the depth gradually decreases; and S. of the Raton Islands there are not more than 10 or 12 feet water. There is little more depth west of these islands, in the large bay, called by the natives Sacco Grande: it is a quiet place to ride in, and principally frequented by vessels in the whale fisheries: but ships drawing any great quantity of water could not have access to it.

There is plenty of water in all the anchorages in the bay of St. Catharine. In that which vessels of war most commonly frequent, you will have the following bearings: North Point of St. Catharine's, N. 69° 30′ E.; middle of the Fort of Santa Cruz, S. 63° 30′ W.; the Fortress St. Joseph, S. 55° 30′ E.; and the point of the Armacaco, on the continent, N. 16° 50′ E.

The depth of the above anchorage is 30 feet; and the bottom is mud, of a greenish cast, and holds well.

Here you enjoy almost always a perfectly tranquil sea, under shelter of the high lands with which it is surrounded, the only exposed part being to the N. eastward; but the winds from this part are here very seldom dangerous.

Many places for obtaining water are in the vicinity of this anchorage: the best is about 2 miles north of the Island Anhatomirim, upon the continent, which is supplied day and night with excellent water, of which you can obtain an ample quantity. You may get permission, at a cheap rate, to take fire-wood, either on the continent or on one of the Isles of Raton, and also for repairing your vessel, if needful. In short, the principal town of the island, and the habitations near this anchorage, furnish, at moderate prices, all kinds of refreshments, &c., which the country produces. The provisions consist of bullocks, pigs, fowls, maize, rice, spirits, farinha, dried meats, sugar, coffee, all tropical fruits, &c. The Island of St. Catharine is, therefore, one of the best ports at which a vessel can be supplied with necessaries, after or before a long voyage.

The anchorages of this island are sometimes plentifully supplied with fish; but the success of the fishing depends upon a variety of causes, with which we are not well acquainted. La Perouse found abundance of fish in November, but I was less fortunate in the same month, and also from May to August. Most of the shores are besides covered with the bones of whales, which it becomes difficult to avoid in hauling the seine.

When you provide yourself with fire-wood from the country, it is better to prefer the young trees; for the old trunks are commonly hollow, and filled with insects and the eggs of reptiles, which are very often venomous, and might be highly dangerous on board your vessel. It will, therefore, always be prudent to throw the wood into the sea before you take it on board.

The winds most frequent in the Gulf of St. Catharine follow the direction of the channel, whether inwards or outwards, but these are seldom violent; and the storms are not dangerous to vessels which are well moored.

From March to September, that is, during the time called winter, or the southern monsoon, the winds in the neighborhood of the islands blow generally from the S., or S. S. W. Sometimes they come on with very great violence, and are accompanied with rain; but these gales seldom last more than 48 hours. Towards the month of October the winds approach towards the E. and N.; the six following months form the *summer*, and are the hottest throughout the year. There are frequently storms, which come from the N. and S. E. round by the west; and if in this season the winds blow from the S. E., they are accompanied with considerable rain: but in general, however, the greatest quantity of rain falls during the months of August and September, although even at this period many years have been exempt from it. The tides are regular at the anchorage; and it may be remarked, that as they blow into the north and south entrances of the strait at the same time, meeting at the anchorage near the town, they return in a similar manner, with more or less velocity, according as they are accelerated or retarded by the prevailing winds.

* A name generally given to those rocks above water which have a round and dark appearance.

The common rapidity of the current seldom exceeds three-tenths of a mile an hour at half tide: and the rise of the water does not in general exceed 3 feet; but at the springs the currents run sometimes one mile and a half per hour, and then the water rises 6 feet. It is high water at the above anchorage at 40 minutes after two on full and change days.

If you should find yourself under any circumstances to require the protection of the forts, this anchorage will not suit: you must in that case draw near to one of the defences adjacent: these are the forts of Santa Cruz on the Island of Anhatomirim; St. Joseph, on the Island of St. Catharine; or the fortress of Raton, erected upon the largest of the two islands of that name. But the shot from these fortifications do not cross on any of these points effectually, at least with the artillery with which they are at present protected.

The governor of the province resides in the town of Nossa Senhora do Desterro, situated about 4 leagues to the S. S. E. of the Fort of Santa Cruz. The passage to it being in a strait well sheltered, is almost always easy for small vessels; and the communication between all the points is quick. Your depth decreases from 6 to 2 fathoms in going from the above anchorages southward.

The position of the flag-staff of Fort Santa Cruz, on the Island of Anhatomirim, is 27° 25′ 32″ S., and the longitude 48° 41′ W. Point Rapa, the north point of St. Catharine's, is in lat. 27° 22′ 31″ S., and in long. 48° 32′ 7″ W. The variation at the anchorage, in 1819, was 7° 29′ 26″ E.

The Island of St. Catharine may be made indifferently upon all parts of the island, and it rarely happens that either the winds or the currents are strong enough to occasion any difficulty in correcting your route; however, you ought to prefer making the southern part of the island in the south monsoon, and the northern part in the contrary monsoon.

Many little isles are visible to the northward of St. Catharine's: the largest of these is Arvoredo, which has been already described. Its distance from Points Ganzos and Zambo on the continent, and from the Isle Pedra de Galle, is nearly the same as from the Point Rapa in St. Catharine's; and you may pass through, in great safety, all the channels formed between these islands and the continent. The depth varies from 24 to 12 fathoms, on a bottom of mud and grey sand: you have only to avoid the rocks and breakers of San Pedro, situated rather less than 3000 toises (about 3 miles) W. N. W. from Arvoredo.

Directly to the northward of the entrance to the harbor of St. Catharine's, is the Bay of Tijoucas, where there is good anchorage. Three leagues to the eastward of all the islands, the depths are from 27 to 31 fathoms.

To the above we here add the remarks of Mr. Bruce, who says, "There are no particular dangers in going to the anchorage of Santa Cruz; and in entering you will carry regular soundings, 13, 12, and 9 fathoms, gradually shoaling towards St. Catharine's Island, until you get abreast of Papagaios Island. It then shoalens abruptly from 7½ to 5 and 4½ fathoms. The best leading mark for a large ship to enter, when she is abreast of the above islands, is to haul over to the westward until Great and Little Raton Islands are in one; then steer for them until you are nearly abreast, or a mile from Santa Cruz, when you may haul over to the eastward, until you get the southernmost Raton Island, which is the smaller of the two, open of the great island. Keep it just open, and you may anchor within a mile of them in 6 or 7 fathoms, good holding ground, and well sheltered. In working out from this anchorage, when you are standing to the westward, do not stand into less than 5 fathoms, for there is a bank of 4 fathoms on its eastern edge, and only 3½ and 3 fathoms on its inner part. It lies rather less than 2 miles to the southward of Santa Cruz. Standing to the eastward, you may bring the Island of Arvoredo on with Point Groca, (St. Jose,) and when you get nearly as far as the Points of Groca and Santa Cruz, you may stand into any depth you please. There is good anchorage under Santa Cruz, where ships commonly touch for water; but the best anchorage is with the small Island Ratones just open to the eastward of the larger one, in 5½ fathoms. The deeper water will be found on the eastern side; but when off Santa Cruz, the western side will be the boldest. There is but a scanty supply of water inside of Santa Cruz, which comes from a small rivulet close to the beach. Here you may fill your casks in the boat, by baling with buckets; but this supply in dry weather sometimes fails. Wood may be either cut or purchased."

The Island of Santa Catharine is of such height as to be discovered in fine weather from 45 miles distant, at which distance there are 70 fathoms water, diminishing gradually towards the shore. Nearing it from the east, it appears with high mountains and deep valleys. Taking the whole together, the southern part appears higher than the northern side. The Morro Camborello is a mountain which appears above every other. Vessels may go round this island with safety. The channel between the main land affords good anchorage, but the best place to cast anchor is on the northern part.

Santa Catharine affords the best place to refit a vessel. There is an inexhaustible quantity of good water, to be got without any expense; fuel and provisions of every kind

at a cheap rate—such as beef, pork, poultry, corn, sugar, dried beef, arack, &c. &c. It is then the most convenient place for a ship to stop, in case of want, and for repairs. When taking on board wood for fuel, it is necessary to take young branches only, and even to let them float in the sea water, in order to destroy the numerous worms, as their eggs are very dangerous on board of a ship.

The coast north of Santa Catharine is every where very high. Woody mountains and deep valleys are to be discovered all round. From Santa Catharine to the Bay of San Francisco, you meet several small islands and rocks, and the last are the small Garcia Islands, 2 miles distant from Joao Diaz Point, which point forms the eastern extremity of the River San Francisco. San Francisco River is not very deep. Its mouth is turned N. N. E., and empties in a large bay, in which you may anchor any where. The shore of this bay is flat, the surrounding land not very high, but from place to place small hillocks are to be seen, which render that place remarkable, particularly by the chain of a very high mountain, to be seen nearly at 9 miles in the interior. The Island of San Sebastian is to be seen 45 miles distant. The shores are very bold. The whole island taken together seems of a triangular shape. The channel affords good anchorage, but is not to be followed in a straight line from end to end. Banks connected with the main land, existing nearly two-thirds of the whole extent, in the direction of N. to S., and consequently, when coming from the north, and starting from a point situated one half mile from the armacao, which is constructed at the head of the island, it is necessary to steer first 5 miles S. 16° W., and from thence S. 45° W., until you are out. This route is nearly 11 miles, and the depth of water from 10 to 20 fathoms. The greatest distance between the opposite lands is nearly 3 miles, but two-thirds of that space is not safe for navigating. It is necessary to near the shore of San Sebastian Island, at no less distance than from ten to twelve hundred yards. The southern entrance is more narrow. The natives say that very large ships may pass through. San Sebastian Harbor is one of the safest in the world, and offers the same facilities as Santa Catharine for provisions of any kind.

No. 1. FROM THE NORTH POINT OF ST. CATHARINE TO CAPE ST. MARTHA GRANDE.*—The land of the Isle of St. Catharine, and the neighboring continent to Cape St. Martha Grande, is very high and woody. The highest mountains perceived from this island are of the Cubatao chain, covered with clouds when the winds from the south prevail, and clear in N. E. winds. At sea, with a clear horizon, the coasts can be easily perceived at 12 leagues distance. The soundings are there from 70 to 80 fathoms, with a muddy bottom. In approaching the coast, the soundings diminish gradually. At 3 leagues distant the soundings are still from 37 to 40 fathoms, and 20 to 30 at 4 miles distant.

The whole coast is safe. The Emulation coasted it at 3 or 4 miles off, and passed between the Irmaos Islands and Moleques do Sul, in 17 fathoms water. The only dangers to be avoided are the islands and islets, which can be perceived at 3 leagues off, and round which there are 15 fathoms water.

The usual anchorages are at Isle de Campexe, Point Pinheira, and La Laguna.

The two first form shelters from southerly winds; the third is only practicable for small vessels, drawing at the most from 7 to 8 feet of water, by reason of a bar at the entrance of the Lagune, near the borders of the lake where the city of Laguna is built.

The Island of St. Catharine is about 9 leagues long, and its greatest width does not exceed 10 miles. It forms, with the continent, a strait in which vessels find excellent anchorages.

The points to distinguish the entrances into the strait are the following:

THE NORTH ENTRANCE.—The Island of Arvoredo, which rises in the form of a sugar-loaf, with two summits (seen at a distance.)

The Islet Badejo, which is in the form of a tiller, and without vegetation.

THE SOUTH ENTRANCE.—The Islet of the Great Moleque do Sul, which resembles a steep beach when seen from the S. E., and for this reason is perfectly delineated on the coast, which is woody.

The Isle Coral stretching from north to south, and round when perceived in this direction. It is covered with trees, and is about 1½ mile long.

If you wish to come to anchor north of St. Catharine's, where large ships ought to anchor, you must follow the directions given by Admiral Roussin; but if you wish to come by the south bar to the city of Nostra Senhora do Desterro, the capital of the island, you cannot do it with a vessel drawing over 13 feet water. You may govern yourself by the following directions:

Steer for Cape Quebra Cabaco, leaving the two Ratone Islands on your larboard hand, not less than a mile and a half distant; when you bring the small Ratone Island to bear east, 2 miles distant, steer S. E. until the two rocks of Itapitinga do Norte are in a line

* From the Surveys of Mr. Barral, (commander of the French surveying brig the Emulation,) who was directed to continue the surveys of Baron Roussin.

with Cape Quebra Cabaco. You will then have on your starboard hand a flat rock, on which, at low water, there are but 4 or 5 feet. As soon as you open this cape to the south of the rocks of Itapitinga do Norte, steer S. W., and proceed on this course until the rocks bear N. N. W.

From thence steer so as to pass within 4 or 5 cables' length east of the rock of Cape Tres Henriques, a wooded cape, and more apparent than Cape Quebra Cabaco. Then steer direct for the little strait of the city, taking care to pass 3 or 4 cables' length from the islet of Point do Lial. From this islet you will enter the little strait defended by Fort Santa Anna on your left, and by the battery of San Joao on your right. You will find there a bottom of 12 to 18 fathoms, and you will perceive, in approaching, the Islet of Gato and the Islet of Vinhas, situated before the city. You will leave the first on your larboard, and come to an anchor in 19 to 20 feet of water, the Island of Gato bearing, by compass, N. N. E., the Islet of Vinhas S. S. E., and the steeple of the cathedral N. E.

The city of Nostra Senhora do Desterro is situated in 27° 35′ 25″ S. latitude, and in 48° 34′ 9″ W. longitude. The variation of the needle in October, 1831, was 5° 29′ N. E.

In coming from the north bar to the city, we frequently found but 7 feet of water, and a muddy bottom; but the mud is at least 5 feet deep, and a vessel lies easy: at high water the passage is made. The Emulation, which drew 13 feet 4 inches, was 3 days coming up to the city. She was dragged through the mud by her anchors, when the water was low or the tide weak.

In coming in by the South Bar, you must have a fair wind, high water, smooth sea, and fine weather, without which the currents may throw you on Fort Isle, or on the Point dos Naufragodos, distant from each other only 280 fathoms. The vessel should draw less than 15 feet. The following is the route to take: steer on a line drawn from Coral Island to Fort Island, towards the last island; when you are abreast of the two Islands dos Papigios, (they are on your left,) you will have the three Irmaos Islands, and the Moleques do Sul on your right, and you will bring the cape to the N. E. to open the passage; arrived at this point, you will steer directly in the middle, until you find yourself south of the Isle dos Cardos, remarkable by a single tree, elevated on the summit. Steer then so as to pass east of the Isle dos Cardos one or two cables' length distant, and from thence continue until you find yourself E. or W. with the south point of Enceado do Brito, half a mile distant. Follow the coast of the continent, until you come up to Cape Pesqueiro Fundo, at 4 cables' length distant. You will pass the village of Enceado do Brito, and at a little distance forward is a group of houses or cabins, forming the little village dos Cedros. On your right, at a great distance, you will perceive the village of Robeirao, situated on the Island of St. Catharine's, and almost before you Isle Largo.

Before arriving to this last, you will have to avoid a reef of rocks always under water. You are on this reef when the towers of the cathedral in the city are W. of the Isle Largo, and those of Cardos by the fort of the south bar.

From the Isle Largo steer N. until you are off the Isle das Cascas, and then steer for the steeples of the city, till you come to the anchorage indicated between Isles Gato and Vinhas.

There are on the coast of the Island of St. Catharine, from Point Rupa, the north extremity, the following islands and islets: the North Moleques, the Isle Badejo, (the outward one,) the two Aranhas Islands, Pavier Island, (of a middling height, and without trees,) Campexe Island, the three Irmaos Islands, the South Moleques, three large white rocks which touch each other (composing the Grand Moleque.) On the coast of the continent, commencing at the south bar, are the following islands and islets: Coral Island, S. E. of Point Pinheira; Araras Islands, (S. E. of Point Bituba;) Tocoromi Islet, (an elevated and perpendicular rock,) S. E. of Araras Island, Lobos de la Laguana, (S. W. of Araras and Tocoromi.)

In passing along the coast, we find the following points and capes: Point Pinheira, Cape Guaratuba, Cape Cirui, Cape Uvidor, Point Viraquera, Point Bituba, or Embituba, Morro-da-Barra, Morro-da-Fora, Cape Santa-Martha-Pequeno, and Cape Santa-Martha-Grande.

At Point Bituba commences the beach, behind which is a lake and the cities of Villa Nova, Santa Anna, and La Laguna. This last is situated on the south side of the lake, at one mile from the bar within, in latitude 28° 28″ 23″ S., and 48° 50′ 17″ W. longitude. This position has been determined on shore.

CAPE SAINT MARTA GRANDE is remarkable on account of several large white rocks, situated on the summit of the cape, which may be taken at a distance for a number of houses. The latitude is 28° 39′ S. and the longitude 48° 49′ 49″ W. The variation of the needle in November, 1831, was 7° 20′ N. E.

No. 2. FROM CAPE SANTA MARTA GRANDE TO RIO GRANDE DE SAN PEDRO.—This space of land, about 95 leagues in extent, has a coast extremely low, having, at intervals, little sand hills and brambles. The land can hardly be perceived in clear weather, from the mast head, at the short distance of 7 or 8 miles, and

from the deck at 3 miles distance at the farthest. It may be divided into three parts. The first runs N. E. and S. W., true; we will call it the Beach das Torres. The easterly part is in 48° 49′ 49″ W. longitude, and the situation of the westernmost part is in 49° 58′ 45″ W. longitude.

The second part runs N. ¼ E. and S. ¼ W., true, and is called the Beach of Fernambuco. The easterly part is in 29° 52′ S. latitude, and 49° 58′ 45″ W. longitude.

The third part runs N. E. and S. W., true, and is known by the name of the Beach of Destretto. The easternmost part is in 31° 12′ S. latitude, and 50° 39′ 45″ W. longitude.

BEACH OF TORRES.—We will remark here that a chain of mountains, distant about 15 leagues from the sea, stretches along in the interior, and ends abruptly at Torres, 25 leagues from Cape Santa Marta Grande.

This beach may be approached within 3 or 4 miles, and has been coasted, at this small distance by the Emulation. It was impossible to find any remarkable points on this route to form a triangulation. I confined myself to fixing the position of the vessel by frequent observations, and from thence deduced the coast by estimating our distance.

We found 30 fathoms of water, bottom of sand, mud, and shells, 4 miles S. of Cape Saint Marta Grande, and from thence to Torres, the soundings decrease to 5 fathoms, almost to touching the shore at this last place. You can judge of the decrease of the soundings, as the distance between the first soundings in 30 fathoms, and the soundings at 5 fathoms, was 25 leagues.

BEACH OF FERNAMBUCO.—This is also more perpendicular than the first, especially in the latitudes of 30 and 31 degrees. The Emulation found 40 fathoms water, with a bottom of sand, mud, and shells, 4 to 5 miles from the shore. She coasted along for half a day.

In steering off shore to the distance of 15 leagues, the soundings augment progressively to 95 fathoms, with a bottom of muddy sand: at a greater distance, no bottom is found with 100 fathoms; at 10 leagues distance, the soundings are about 83 fathoms.

BEACH OF DESTRETTO.—It terminates at Rio Grande de San Pedro. You will find 10 to 15 fathoms in coasting along, at the distance of 3 or 4 miles. The Emulation coasted along 17 leagues at this short distance, over a bottom of sand. It is not higher than the beach of Fernambuco, but there are hills of sand and less vegetation. Twenty to 24 leagues S. E. of this beach we find 38 and 39 fathoms water, bottom of mud and sand, and in sailing towards the land, these soundings gradually decrease.

We will also remark that of the three beaches, that of Fernambuco, the easternmost, has more water towards the shore, and also at a distance; on the contrary, that of Destretto has the least.

RIO GRANDE DE SAN PEDRO.—The approach to Rio Grande de San Pedro, is difficult on account of the want of elevation of the neighboring land, it being low for a distance of 95 leagues north, and 40 leagues south. You should not attempt the bar except when the wind is N. E., the weather very fine, and appearing as though it would last several days. You should coast along the beach of Destretto at a small distance, until you perceive the tower, which is situated at the north point of the bar, two miles inside. You must not, if possible to avoid it, get embayed or wind bound on the south side, because the sea breaks in the shoal water.

The bar is not practicable for vessels drawing more than 10 or 10½ feet, in ordinary tides.

As soon as they perceive from the tower a vessel, they hoist a red flag. It is the signal given to the pilot boats to go to the bar and sound it out.

The vessel ought, on her side, to show her draft of water by means of white, red, and blue flags, and a blue pendant.

* *Palms of water.*	*Flag.*	*Palms of water.*	*Flag.*
10	White.	12½	White. Red.
10½	Blue.	13	Red. White.
11	Red.	13½	Blue. Red.
11½	White. Blue.	14	Red. Blue.
12	Blue. White.		

These signals are repeated by the tower; and the pilot boat, on perceiving them, makes a signal, if there is water enough on the bar. If the bar be impassable, the tower strikes the red flag, and the vessel should steer off; if there be sufficient water, the boat hoists a flag; if you ought to steer for it, it keeps the flag in the same situation; if it lowers it towards the right you must keep to the starboard; if it lowers it towards the left you must keep to the larboard.

* The palm is 9½ English inches.

The bar changes every year, during the winter; and, as soon as the pilots have well ascertained the channel, the president of the province notifies the government at Rio Janeiro. It sometimes happens, that it is impossible to cross the bar for a long time, after a great S. E. gale.

The geographical position of the tower is 32° 07′ 20″ south latitude, and 52° 8′ 45″ W. longitude. The variation of the needle, in the month of November, 1831, was 8° 30′ E.

No. 3. FROM RIO GRANDE DE SAN PEDRO TO CAPE SAINT MARY.—In this part of the coast the soundings are very shallow and variable, you are therefore obliged to keep off. The Emulation, in 33° 30′ 30″ S. latitude, and 52° 19′ 45″ W. longitude, passed at once from 22 fathoms, sand and mud, to 18 fathoms, sand and shells; she soon ascertained the edges of a great bank extending from the coast 7 or 8 leagues, and extending to the Castillos.

The Castillos are black and scarped rocks, situated at a very small distance from the land, in 34° 24′ S. latitude, and 53° 40′ 45″ W. longitude. At the north is found an immense bay, in which you find shelter from S. W. winds, but you should quit this anchorage as soon as the winds vary to the E. and the N. E.

South of the Castillos is Bahia Falsa, of which we shall speak hereafter.

Some time before arriving at these rocks, if you coast along the land 11 to 12 miles in coming from the N., the soundings show 11 to 12 fathoms water, with a bottom of sand; when shells are mixed with sand, you are still on the Great Bank, and you steer a little more to the larboard; you will then perceive two hills having the form of teats, the only ones which can be seen to Cape Saint Mary.

No. 4. WINDS, TIDES, AND CURRENTS.—At the Island of St. Catharines, the prevailing winds are N. E., N. W., S. W., and S. E. The winds from N. W. bring fine weather, and the winds from S. E., in the winter, are extremely rainy.

The tides are not regular in the strait until the approach of a new and full moon. The difference between high and low water is, there, scarce above 5 feet.

The sea rises in the S. basin from the S. to the N., and it rises in the N. basin from the N. to the S., in such a manner, that the waters meeting from two sides accumulate towards the city, built near the little strait, which serves as a limit for the whole strait, of which the two basins are composed. It falls also in a contrary manner from which it rises.

About the beach of Rio Grande de San Pedro, the winds from the S. W., N. E., N. W., and S. E., are equally the most frequent, and those from the S. E. the most violent and dangerous. A vessel surprised by a sudden squall from this quarter, on the coast, cannot get away from it. By a wind from the E. S. E. the Emulation, under top-gallant sails, would have been obliged to run on shore on the beach of Torres, if the wind had lasted several hours; the sea broke in 30 fathoms of water, and the vessel ran great risk of being dismasted by reason of the great shocks that she experienced. During these winds from the S. E., the sea runs extraordinarily high, and the currents run rapidly towards the shore.

The winds blow usually from the S. E. after having blown from the S. W. These last winds do not usually blow until after the N. E. winds have varied to N. W. and W. N. W.

RIO DE LA PLATA.—The River Plate is 55 leagues wide at its mouth, and runs nearly W. N. W. and E. S. E., true. It is formed by the waters of the Uruguay and the Parana, two great rivers which receive the waters of an immense number of other rivers, among which may be mentioned the Paraguay, the Picolmaya, and Rio Grande de Curtiba.

The capes which mark the entrance are those of Saint Maria and St. Antony; the first is situated on the northern side, and the second on the southern.

The coast on the northern side, comprised between St. Maria and the mouth of the Uruguay, is in general high.

The coast on the southern side, comprised between Cape St. Antony and the mouth of the Parana is, on the contrary, very low; it is on this side those immense plains, known under the name of Pampas, are found.

The river sensibly diminishes in width from its mouth to the confluence of the Rivers Uruguay and Parana. It may be divided in two parts, nearly equal in length.

The first extends from Cape Saint Maria and Saint Antony on the north, to the river of Santa Lucia, and to the south to Point das Piedras de San Borrombon;* the water of

* The Point das Piedras de San Borrombon forms with Cape St. Antony a great bay, called the Ensenada of San Borrombon, in which two small rivers discharge themselves, the San Borrombon and the Salado: this last is the largest, and during the war between Buenos Ayres and Brazil, served as a refuge to a great number of privateers; it is difficult to discover its mouth; the following, however, serves as an indication of it. The south side is covered with bushes, which terminate at two brick towers, used formerly as lime kilns; and at the N. part of the entrance are two banks of sandy land, on which two batteries are built.

the river is there brackish. The second part extends from these last points to the confluence of the Uruguay and the Parana; the water is here generally sweet.

The depth of the water in the River Plate increases in going from this confluence to the sea, and the bottom between the banks is generally composed of mud, and frequently of soft sand-stone, to the meridian of Monte Video; from this place it is of oozy sand, sand only, sand and shells, and sand and gravel, as far as Cape St. Antony, except towards the north side, and towards Ensenada de San Borrombon, where it is formed of mud. The south side, from near the River Salado to near the borders the Ensenada de Barragan has a border of soft sand-stone two to three leagues wide, on which it is very shallow.

We may consider the bottom of sand, sand and shells, and sand and gravel, situated east of the meridian of Monte Video, as forming an immense bank, the highest part of which is known by the name of the English Bank.

The bottom of hard sand, found west of the same meridian, forms sundry banks, on which the depth of water is from one to one and a half fathom at the most.

Three cities are built on the north bank; the first, after leaving Cape St. Mary, is Maldonado; the second, Monte Video; and the third, the colony of San Sacramento: they belong to the Republic of Banda Oriental of Uruguay, the chief of which is Monte Video; from Monte Video to the colony of Uruguay is 10 leagues.

The city of Buenos Ayres is the only one situated on the south side of the river; it is the chief city of the United Provinces of La Plata; the distance to Parana is 5 leagues.

From Cape St. Maria to Maldonado, is 16 leagues; from Maldonado to Monte Video, 21 leagues; and from this last city to Colonia, 28 leagues; the distance from Cape Saint Maria to the Uruguay is thus 75 leagues.

From Cape St. Antony to Buenos Ayres is 45 leagues, and from thence to Parana, 50 leagues; the south side of the river is thus 25 leagues less in extent than the north side.

On the north side there are many islands, and a number of rocks, above and under water: there are none on the opposite side as far as Buenos Ayres.* These islands are Lobos, 8 miles S. S. E of Maldonado; Goriti, in the Bay of Maldonado Flores, E. of Monte Video, 15 miles; San Gabriel, Farallon, Lopez, before Colonia and Hornos, 5 and 6 miles west of this city. The rocks are all a short distance from the shore.

No. 6. BANKS.—The first we meet with coming from the sea, is the English Bank, which breaks in 35° 11′ S. latitude, and 55° 54′ 45″ W. longitude; it is 11 miles south of the Island of Flores.

The second is Archimedes Bank, on which an English frigate of this name touched. It is very small, and is situated S. ¼ E., (true,) from Monte Video, at 19 miles distance.

The third is New Bank, formed within a few years, very probably by the sand drifted from the little bank of Ortiz. It is situated on the southern side of the river.†

The fourth, and the largest of the whole, is the Ortiz; its eastern extremity is only half a mile wide, and is north of New Bank; its western extremity stretches to within a very short distance of Colonia; it is nearer the north than the south side of the river. Its greatest width is 11 to 12 miles.

The fifth is the Chico Bank, a dangerous bank, by reason of the irregularity of the sounding on the edges. It is placed between the Ortiz Bank and the south side.

The sixth and seventh are the Banks of Santiago and of Lara, and the eighth, ninth, and tenth, those of Cuidad, Camerones, and the Palmas, all situated on the same side, except the Palmas, which is between the confluence of the Uruguay and Parana, on the way from Buenos Ayres to Colonia.

In going to Maldonado, there is no bank to fear, but in going to Monte Video, you must avoid English and Archimedes Bank; in going to Buenos Ayres you have to pass all the banks. Vessels do not generally take a pilot in going to Monte Video, but they rarely omit to take one in going to Buenos Ayres.

The pilots who conduct vessels to Buenos Ayres, live at Monte Video or Point Indio. They keep under sail, or at anchor near the coast in schooners or cutters.

The government of the United Provinces of La Plata, caused to be placed several years since, large buoys on the edges of most of the banks, but bad weather and the strong currents have caused them to disappear. The government of Monte Video, have erected a tower with a good light, on the Isle of Flores, elevated about 120 feet above the level of the sea; it can be perceived in the night at 15 or 16 miles distance, and serves to avoid the English and Archimedes Banks.

No. 7. WINDS, TIDES AND CURRENTS.—At the entrance of the river, and at Monte Video, the prevailing winds are the N. E. and S. W.

At Buenos Ayres and at Colonia, they are N., N. W., S. E. and S. W.

During summer, and in fine weather, the winds blow in the whole river, with consid-

* The islands situated at the Point of Santiago of Ensenada being very small we do not mention.
† The American corvette Vandalia touched on this new bank.

erable regularity, from the E. to the S. E. from ten o'clock in the morning, until sunset. In the night the winds vary to the north.

The winds from S. W. and S. S. W. are known about the River Plate, by the name of the pamperos, from the Pampos from which they come.

The pampero lights up the sky, the same as the N. W. winds in Provence, and the N. E. on the coasts of Britany; it blows usually after rain, or when the wind has varied from the N. to the N. W., and to W. N. W., and in summer after a calm and very hot day. Oftentimes it comes all at once, with a strong wind from the N. E., when the sky is covered with clouds; the explosion is then sudden and very dangerous; and it is best for vessels in the River Plate, or the entrance, to get under easy sail, as soon as there are any indications of a pampero.* The barometer falls previous to the pampero and rises afterwards.

As it rains oftener in winter than in summer, this wind is more frequently in the winter, and lasts each time from two to three days. In summer it blows with more violence and ceases sooner; it is then called in the country the Turbonado (Torment.)

When the weather is fair, and the wind light and constant, the tides on this coast are regular; on the contrary, in bad weather and strong winds, the tides are irregular, and form currents which oftentimes run from 4 to 5 miles per hour.†

At Buenos Ayres the sea is high with the winds from the S. E., and low with the winds N. W. and S. W. At Monte Video and the remainder of the northern side, the river rises with the winds from the S. E. and S. W., and falls with those from the north. The difference between high and low water on the borders of the river, rarely exceeds 4 or 5 feet; but in strong gales from the S. W. they sometimes rise 10 feet.

In the months of March, April, and a part of May, the River Plate is higher than in the other months of the year, occasioned by the rivers Parana and Uruguay. It then brings down trees and shrubs, which form little islands of verdure sufficiently remarkable. This is the epoch of the finest season in this interesting part of South America, of moderate breezes and a mean temperature. During the spring, summer and winter, the winds are very strong, and the temperature of the atmosphere very variable.

No. 8. ANCHORAGES.—Whenever the lead shows mud, you can anchor, having care however to anchor far enough from the banks not to be driven on them.

With the winds from the S. the anchorages on the south side are best, with the winds from the N. the opposite side is preferable.

Large vessels and frigates may go up to Monte Video; vessels drawing less than 17 feet, may go up to Buenos Ayres and the Hornos Islands.

The anchorages which shelter from the N. W., N. E., E., and S. E. are Maldonado, Monte Video and Hornos. Those which give shelter from S. W. winds, are Ensenada de Baragan and Buenos Ayres.

Small vessels may anchor at Cape St. Mary, at the entrance of the River Santa Lucia and at Colonia on the north side; at Rio Salado within Ensenada de Baragan, and at Riachuelo near Buenos Ayres on the south side.

You can come to anchor at Maldonado in 6 to 8 fathoms of water: at Monte Video, in the road in 5 to 6 fathoms, in the port in 3 to 3½: at the Hornos Islands in 3½ to 4½ fathoms; in the road of Ensenada de Baragan in about 5 fathoms; at Buenos Ayres in the road in 3½ to 4½ fathoms; and near the city in 2 to 3 fathoms.

In the anchorages on the north side, you should moor for the S. W. winds; in the others for the S. E. winds.

Of all these ports and roads, the best holding ground is at Maldonado. It is much covered with sand. In the other places the bottom is of soft mud, through which the anchors drag in sudden flaws of wind. During the pamperos, the Hemos Islands offer an excellent anchorage, because the sea is broken off by the Palmas Bank. This last anchorage was not known when the Emulation was there in September, 1830.

No. 9. DEPTH OF THE RIVER AT THE ENTRANCE AND OFF THE MOUTH.—When in the parallel of Cape St. Mary, and in the longitude of 52° 8′ 45″, which is that of Rio Grande de San Pedro, the soundings at the distance of 33 leagues from the cape are 90 fathoms, mud; at 25 leagues the bottom is sand or mud mixed with shells, and show 40 to 28 fathoms only. In going towards the cape, the soundings decrease irregularly.

On the parallel of Castillos, at 33 leagues distance, the depth of the water is 58 fathoms, and the prevailing quality of the bottom is sandy.

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* The Emulation, in the night of the 31st of August, 1830, 35 leagues off from Lobos Island, under foresail and topsails, was surprised by a pampero, which in two minutes carried away the topsails and forced her to scud under bare poles; a brig was upset in the river and an enormous whale cast on shore.

† At the beginning of March, 1831, the Emulation explored the south side; she could not stem the current from the N. W. in sight of Point das Piedras de San Borrombon, although she had a fair wind and all sail set, and a four knot breeze, she was obliged to come to anchor twice.

In sailing on parallels farther south than Cape St. Mary, you will find less water in the same longitude, and the depth diminishes more regularly. At 15 leagues from Cape St. Antonio, the depth is 17 fathoms, bottom of sand. At 28 leagues S. E. from the same cape, you will have 45 fathoms, same quality of bottom. North of the cape and 5 leagues from the land, you will have 7 to 8 fathoms water.

If you shape your course for the English Bank, that is to say, in the parallel of 35° 11′ S., you will find 6 to 7 fathoms, and a sandy bottom, 5 leagues before arriving there. You are then nearly in 55° 39′ 45″ longitude.

On the parallel of 35° 30′, when you reach the longitude of 50° 39′ 45″ W., the bottom is of fine sand, and the depth 8 fathoms. On the parallel of 35° 35′, and to the parallel of Cape St. Antonio, the bottom is sand mixed with shells and gravel.

In the latitude of 35° 20′ S., when you have passed the longitude of the English Bank, the soundings do not reach above 8 fathoms: on the parallel of 36° it reaches to 11 and 12 fathoms; west of the bank, on the same parallel, there are 5 and 6 fathoms only.

At 20 leagues distance from the entrance to the river, the water loses its blue color, and becomes green, tinged with yellow.

In coasting along the north side, in sight or near the land, you will have mud soundings: running on a parallel greater than that of Lobos Island, you have no soundings of mud except in the neighborhood of the meridian of this island: at two miles south you have 16 and 17 fathoms of water; and at 6 miles, 23 and 24 fathoms, mud bottom. In going from Lobos to Monte Video, the depth diminishes gradually, but irregularly. In the passages formed by the hard sand banks, situated between Monte Video and Buenos Ayres, there are from 3½ to 5½ fathoms of water.

No. 10. POINTS TO RECOGNIZE IN MAKING THE LAND.—There are three, Cape St. Mary, Lobos Island, and Cape St. Antonio.

CAPE ST. MARY.—Its position determined on shore, is found to be 34° 39′ 1″ S. lat., and 54° 9′ 45″ W. longitude. The variation of the needle, in the month of February, 1831, was 10° 7′ N. E.

Although of but little elevation, the cape is distinguished by the neighborhood of two little islands named Tuna and Palonna, distant from each other only 260 feet. The separation forms a passage for small vessels drawing less than 10 feet water, and is the entrance of a bay which is sheltered by the cape and the two islands. You find there from 11 to 12 feet of water. It will contain perhaps 7 or 8 vessels.

The Island of Tuna, the smallest and the nearest to the cape, is covered with the cactus, which is peculiar to a sandy coast. You will remark also, in coming from sea, a large sand hill with a double peak, S. W. of the cape, near a very flat beach. At the north, on a hill, is seen an establishment consisting of a group of houses called an Estancia, for raising cattle. Near to these houses are many trees, and all about them many enclosures.

The coast to the north forms a large bay, 14 miles in extent, with a point surrounded by the Palmarone and Castillos Islands. The Island of Palmarone, the nearest to the point, is verdant; the Castillos are barren. Otherwise, this resemblance to Cape St. Mary has caused sometimes one to be taken for the other, and has caused many shipwrecks. It has been named, for this reason, False Bay.

At 2 miles east of the Castillos, are found 16 fathoms of water, bottom of sand. From these islands to Cape St. Mary, at the same distance, are found 11 to 14 fathoms, same kind of bottom. At the east of the cape, 11 fathoms, a bottom of sand, or sand and gravel; S., at 13 miles distant, 20 fathoms, sand; and S. W., from 18 to 22 fathoms, bottom of mud.

ISLE OF LOBOS.—It is situated in 35° 0′ 51″ S. lat., and in 54° 54′ 15′ W. long., and is only a mile in extent. It can be seen 15 to 16 miles off. It is inhabited by a great number of seals, from which it takes its name. The eastern part ought to be avoided, by reason of a chain of reefs which extends 3 miles off.

This island is without vegetation. Large vessels pass easily in the strait between it and the main land, and find there 17 fathoms of water.

Its position has been determined from the sea and the Island of Goriti by triangulation. The variation of the needle is the same as at Cape St. Mary.

CAPE ST. ANTONIO.—We comprehend under this name a large collection of little mountains or hills composed of sand, which stretch to the E. and S., and which are terminated in the west by a low coast covered with bushes.

Its position, determined at the anchorage, is in 36° 19′ 36″ S. lat., 56° 47′ 15″ W. long. The variation of the needle was, in the month of December, 1831, 13° 30′ N. E. The point determined is that where the separation takes place between the sand hills and the low verdant coast.

This cape is surrounded by a bank of sand which breaks oftentimes at a considerable distance from the land, extending N. and E., and ought to be carefully avoided.

No. 11. NAVIGATION AT THE ENTRANCE AND IN THE RIVER PLATE.—The description that we have given of this river naturally indicates the pre-

cautions necessary to take to ascertain the points of the entrance. We think it preferable to make the north side, as the land is the highest.

Some navigators pretend that they can always judge of their situation, out of sight of land, by the depth of water and the quality of the soundings.

We do not partake of their security in this respect, because, in exploring the south coast of Brazil, in 1831, we found soundings on all the coast nearly of the same depth and quality as towards the entrance of the river. Besides the Great Bank, whose position we have determined between the Rio Grande de San Pedro and the Castillos, has the same sort of soundings we meet with west of Cape St. Mary, and causes, by this resemblance, numerous errors.

We advise mariners bound to the River Plate, to be well assured of their position by frequent observations of latitude and longitude, and to take them with the greatest precaution, as the currents may deceive them between the hours of observation.

If the winds are well established from the N. E., making the land about Cape Mary has this advantage, that you can recognize a larger extent of land before entering the river. But in all other circumstances Lobos Island has this advantage, that it offers more chances of success, by the position of the island, to avoid being wind-bound on the north coast, and to beat up with greater advantage. Making the land at Cape St. Antonio should be considered the most difficult and dangerous.

No. 12. COURSE TO MONTE VIDEO.—Being south of Lobos Island, at 2 or 3 miles distant, the direct course for Flores Island is W. 7° N., true, or W. ½ S., by compass. But we know the River Plate is subject to very variable currents; and you should steer in such a manner as to approach the north border of the river, rather than the south side, on account of the English Bank You will perceive in good season the Tower of Maldonado, and the elevated land to the east. In sailing along at a distance of 5 or 6 miles, you will distinguish a point formed of black rocks, on both sides of which, to the right and the left, are sand beaches. This is Black Point, or Point Negro, situated 14 miles from Maldonado, near a vast sandy bay. The high lands on the city side are remarkable for a great white band, which shows itself on both sides of Whale Point.*

When Point Negro bears N., 6 miles distant, the Island of Flores bears W. 7° N., true. The Island of Lobos is then on the same bearing, about 37 miles distant, and the soundings are from 13 to 14 fathoms, with a muddy bottom.

The land north of Point Negro makes a deep bend, and becomes lower. In steering along in sight of land, you can distinguish the hills of Afilar, situated in 34° 47′ 15″ S. lat., and 55° 31′ 8″ W. long. When they bear by compass N. by W., and the nearest hill bears E. 45° N., you are then 27 miles distant from Flores. The soundings are then 12 to 13 fathoms, bottom of mud, and still on the same rhumb with Lobos. The hills of Afilar are isolated, and resemble two teats.

In running W. ½ S., by compass, you have to run only 12 to 13 miles to perceive from mast-head the tower built on Flores. This island at first resembles three islands, then the lower part gradually shows itself, and at the distance of 5 miles, if the sea is low, the whole island is seen. If the sea is high, the island at the same distance appears in two parts.

If it be night, as soon as you perceive the light on the tower, steer direct until within 4 miles distance.

From thence keep on the larboard side, leaving the island on the starboard hand, and passing within 2 or 3 miles south of it.†

Between Flores and English Bank, the bottom is mud, and the depth of water 7 to 8 fathoms.

From Flores to Monte Video is 16 miles in a strait line, and you must steer by compass W. by S.: avoid Point Brava.

Point Brava, situated east of the city, is formed by a long line of rocks stretching off from the land. You must give a good berth to a rock detached from the rest. A large white house is built north of Brava, and another, a smaller one, is situated towards the middle of the rocks. In quitting Flores you can, at the same time, if the weather be clear, perceive the cerro, or hill of Monte Video, and soon after the steeples of the cathedral in the city.

If the wind is from the N., or N. E., you ought to steer in the night W. by S., to double Point Brava. But if the wind is from S. E., or E. S. E., it is prudent to steer W. S. W. You should, by way of precaution, in either case, bring the light of Flores

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* Whale Point is the west extremity of the Bay of Maldonado. It is very near the same parallel of the tower of the city, although the Spanish and English charts place it W. S. W. of the tower.

† You can pass north of Flores, taking the precaution to pass at a good distance from the eastern point, to avoid a bank of rocks under water, and which extends a mile and a half north. You can anchor only north of the tower one or two miles distant.. The Emulation anchored here in a gale of wind, in January, 1831.

to bear E. by N., or E. N. E., to be assured that the currents have not set you towards Point Brava.

When the hill of Monte Video bears N. W., by compass, the point is doubled, and you steer gradually towards the starboard hand, if you would anchor in the harbor. A large vessel, which can only anchor in the open road, should steer W. by S. from Brava, and anchor in 5 fathoms.

South of Brava, one mile distant, there are from 5 to 6 fathoms of water.

On the passage from Lobos to Monte Video, and also in the navigation of any part of the river, you must estimate the distances run by a ground log, that is to say, by a log of which the "chip" has been replaced by a piece of lead. If you throw the common log immediately after the deep log, the difference given by the two logs shows if the currents are in favor of, or against the vessel.

As any part of the coast between Point Negro and Flores may be approached within 5 or 6 miles, it may be well, in the night-time, to steer wide to the starboard. The revolving light on the island, in this case, may be perceived on the larboard side, but it will be easy to rectify the vessel's course in steering directly for it, and then leaving it on the starboard hand, when you estimate yourselves 4 or 5 miles distant. You will by this means certainly go clear of the English Bank.

The cerro of Monte Video is 475 feet high. They have established there a fixed light, which can be seen in clear weather at only from 5 to 6 miles distance.

If you wish to go to Monte Video south of the English Bank, you must, in entering the river, place yourself on the parallel of 35° 30″, and steer W. by S. with northerly winds, and W. S. W. with southerly winds.

The soundings are at first fine sand, then sand of the usual kind, farther on muddy sand, and again mud. You will be in this last case on the meridian of Monte Video, and you ought then to see the hill of Monte Video, which can be seen in the day-time, in clear weather, 9 leagues distant. The geographical position of this hill is 34° 53′ 2″ S. latitude, and 56° 16′ 30″ W. longitude.

If in spite of your precautions you should get in 5 or 6 fathoms of water in passing S. of English Bank, it will be necessary to steer more to the larboard, and keep in from 7 to 9 fathoms.

Monte Video is in 34° 54′ 11″ S. latitude, and 56° 13′ 18″ W. longitude. The variation of the needle in September and December, 1831, was 11° 42′ 24″ N. E.

In a thick fog, or in the case of uncertainty of the true position of the ship, it is best to anchor, rather than pursue your course up the River Plate.

No. 13. COURSE TO BUENOS AYRES.—Vessels that do not wish to take the passage by the Island of Flores, must run on the parallel of Point Piedras de San Borrombon, and steer true W. until they make it. Its geographical position is 35° 27′ 40″ S. latitude, 57° 9′ W. longitude. This point is very low, and can only be perceived in clear weather. You will remark on the right many woody hills, among which the highest bears nearly N. W.*

From Point Piedras de San Borrombon the course is the same as when the vessel has passed Monte Video.

Vessels that draw less than 9 feet of water, pass generally over all the banks between this last city and Buenos Ayres.

Those drawing 13 feet, may pass between Chico Bank and the south side.

Those drawing 15 feet, may pass between the channel formed by Ortiz Bank and the north side.

Those drawing 15 or 17 feet, should choose the passage between Ortiz Bank and Chico Bank.

PASSAGE BETWEEN CHICO BANK AND THE LAND.—On leaving Monte Video, steer S. W., by compass, 30 miles, to avoid being drifted on the Ortiz by the currents. You must then head W. S. W. until you make Point Indio, or rather Salvador Grande.

Point Indio is in 35° 15′ 20″ south latitude, and 57° 11′ 42″ west longitude, and 52 miles from Monte Video, it is very low, and can only be known by the woody hills in the east part, while the coast to the west has no hills. When you reckon yourself 9 to 10 miles from Point Salvador Grande, head W. N. W., along the land. You will soon perceive the three ombu trees† of the Magdalena, and then the church of the same name. When the first ombu tree bears S. by E., by compass, you are then N. and S., true, from the east point of the Chico Bank; when the church is on the same rhumb,

* This hill is called Salvador Grande. It is situated between Point Piedras de San Borrombon and Point Indio; the hill situated E. of Salvador Grande, is called Salvador Chico. The pilots confound Indian Point with these hills.

† The ombu is a tree which thrives on the borders of the River Plate; it is as thick and busby as a walnut tree: its wood is so peculiar, that it is good for nothing, not even to burn. It grows very rapidly.

you are in the middle of the channel. You will distinguish in a short time a large single ombu tree, on a hill, and more distant, three other ombu trees, forming a single group.

In sailing along with the land in sight, it is better to steer first one side and then the other, to ascertain the limits of the border of soft sand-stone, which we have said exists in this part of the river, and not to quit it more than 2 or 3 cables' length, in obtaining with the lead alternately soft sand-stone and mud; by this means you will avoid the Chico Bank.

When you distinguish two small elevations covered with bushes and trees, and an ombu tree by the side of two low houses, you have passed the narrowest part of the channel. When you are N. and S., true, with these elevations, you are entirely clear. From thence you may follow the coast, or steer N. W., until you make the edges of the Ortiz.

In the first case it is necessary to steer at a distance from the land, twice as great as before, to avoid the Banks of Santiago, Lara, and Ciudad. In the second case, which is the most prudent, you must pay great attention to the soundings. The depth increases at first to 5 fathoms, at the least, and then diminishes gradually to 3½ and 3 fathoms. As soon as you have these last soundings, you are on the edge of Ortiz, and you must then head to the west.

This course will bring you towards the south side. You will soon see the village of Quilmes, situated on a little hill, on which there are many ombu trees, and the towers of Buenos Ayres, and the vessels anchored in the open road. It is as well when these different objects are well distinguished, to steer W. N. W., to avoid the Ciudad Bank. As soon as the towers of the cathedral bear S. W., you are in the outward road of the city.

The city of Buenos Ayres is in 34° 36′ 18″ S. latitude, and 58° 23′ 57″ W. longitude. The variation of the needle, in March, 1831, was 12° 30′ 59″ N. E.

PASSAGE BETWEEN ORTIZ AND THE NORTH SIDE.—In leaving Monte Video, you may follow the land along 6 miles distant, taking care to avoid the Panella Rocks, near which is a large iron buoy,* secured by means of a strong anchor and chain.

The Panella Rocks are situated in 34° 54′ 15″ S. latitude, and 56° 26′ W. longitude. You are on them when you see Point das Yeguas of the hill of Monte Video with the steeples of the city, and Point Espinillo bears N. by E., by compass, distant 5 miles. These rocks are never uncovered, but when the water of the river is very low, it occasions a long eddy, which may be easily distinguished.

Point Espinillo, though low, is apparent, because it terminates the coast of the hill of Monte Video, and it forms the entrance of the river of Santa Lucia, 11 miles from Monte Video.

Being N. and S., true, with Point Espinillo, you must steer W. by N., by compass, and follow the land always at the distance of 6 or 7 miles, to avoid the little banks of sand on the borders of the river. You will soon perceive the high scarped mountains, called Barrancas de San Gregorio, or Santa Lucia. When you are N. and S. with their east extremity, called Point de Jesus Maria, steer W. N. W., until you bring this point to bear E. ¼ N., by compass. You must then head to the W., until you make Point Sauce,† the only part of the coast which is woody. The latitude is 24° 25′ 20″ S., and the longitude 57° 26′ 21″ W.

From thence you may coast along at a short distance, until you pass north of you a great bank of rocks, of which some are out of water, and are known by the name of the Pipas. You will thus arrive off Point Colonia, with a considerable depth of water, but in a very narrow channel between this part of the coast and the Ortiz Bank.

When you are before the city of Colonia, you leave in good season, on your right, the San Gabriel Islands, Farallon and Leper, and steer then S. W. for Buenos Ayres.

The navigation south of the Chico Bank, and north of the Ortiz Bank, is not practicable, except with a fair wind and a favorable current.

PASSAGE BETWEEN THE CHICO BANK AND THE ORTIZ BANK.—You may leave Monte Video until within 9 or 10 miles of Salvador Grande, then you bring the vessel's head W. N. W., to bring the first ombu tree of the Magdalina S. E., and avoid by this course the new bank. From this the course is N. W. ½ N.

This course leads directly to the edges of the Ortiz Bank, and as soon as you come up to this bank, and have 3¼ to 3½ fathoms, bring the head W., until you perceive the village of Quilmes and Buenos Ayres.

If the winds are ahead and the currents favorable, you may beat between Chico and

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* This buoy was placed by the Emulation, in May, 1831, by request of the government of Monte Video, to replace one carried away by bad weather.

† This point is so named from a little river of the same name, before which, small vessels bound to Colonia, or from the Uraguay, anchor. The brig Star of the South, came near being lost in attempting to approach this point, on some rocks covered with water, which were not seen, or indicated on any chart. Fortunately, a brig anchored near, prevented the loss, by making us a signal.

Ortiz Bank, but the tacks should be short, and you should prefer the neighborhood of the Ortiz, because this bank is announced by the progressive and regular diminution of the soundings. If the currents are contrary, you should anchor between the banks, taking care to avoid the soft sand bottom which you often meet in the River Plate.

No. 14. COURSE FOR THE HORNOS ISLANDS.—If you are before Colonia, going from Monte Video to the north of the Ortiz, leave the islands on the right, and when you bring the Island of Farallon to the north, steer N. N. W., and then N. by W.; you will soon see the Hornos Islands on the same line, the last islands after leaving Colonia, and covered with small trees, and very bushy.

You will anchor N. W. from the outward one, and at from 1 to 1½ mile off.

In going from Buenos Ayres, you must steer so as to bring Farallon north of you, and then steer as in the preceding case.

Colonia is situated in 34° 28′ 14″ S. latitude, and 57° 50′ 37″ W. longitude. The variation of the needle was, in September, 1830, 11° 8′ N. E.

Additional Remarks, by Capt. Heywood.

At the entrance of the Plata,* the prevailing winds, during the summer months, from September to March, are north-easterly, with tolerably clear weather over head, but a dense atmosphere near the horizon. These winds haul generally to the eastward as you advance up the river; and, about the full and change of the moon, strong breezes from the south-eastward are common at this season, accompanied with rain and foul weather. At Buenos Ayres, during the summer months, the S. E. winds are generally fresh in the day-time, hauling round to the northward in the night.

"During the winter months, from March to September, the prevailing winds, at the entrance of the Plata, are S. W., or more westerly; but, up the river, more generally from the northward than the southward of west.

"The winter season is the best, in point of weather, at Buenos Ayres; for, the winds being chiefly from the N. W. to S. W., the water is smooth, and the communication can be kept up between the shore and the shipping with more facility. The weather is sometimes, but not frequently, foggy. Fogs are most common in the months of July, August, and September, and prevail more at the entrance of the river, as far up as the S. E. tail of the Oritz, than above the banks.

"As it cannot be said that there are regular tides in the Plata, but currents, as uncertain in their duration as they are irregular in their rate and direction, no certain allowance can be made for them; therefore, a ground-log should always be used, to know the course made good, and distance run.

"The tides, generally speaking, when the weather is fine and settled, and the winds moderate, do not, in any part of this river, rise or fall more than 5 or 6 feet; though at Buenos Ayres, at the distance of 8 miles from the city, we found, in his Majesty's ship Nereus, when the winds were strong at N. W., so little, sometimes, as 15 feet water; while with strong breezes from E. S. E. to S. S. W., the depth was upwards of 5 fathoms; but, except on such extraordinary occasions, we had between 17 and 22 feet water. I have heard, however, some marvellous stories of the river having been almost dried up across from Buenos Ayres to Colonia, during heavy westerly gales.

"The River Plata has many singularities, which I think may, in a great measure, be accounted for, from its formation being so different from any other known river. Its entrance being very wide and very shallow, it is affected by every change of wind in a most extraordinary manner; so much so, that a shift of wind may be predicted almost to a certainty, by observing carefully the state of the mercury in a barometer, and the set of the currents, which usually shift before the wind. In calm weather the currents are generally very slack; and then as regular, almost, as tides: setting up and down the river alternately. When the winds are variable, the currents are equally so; and I have known the Nereus to be current rode four different ways in less than six hours. When the current comes in from the eastward, along the north bank of the Plata, a north-easterly wind may generally be expected to follow; and at the same time, (should the wind have been previously to the S. E.,) the mercury in the barometer will fall a little; but much more if the transition be quick from south-west, without stopping in the south-eastern quarter.

"When the wind continues in the north-east quarter, the mercury is more depressed

* *Shoal off the Rio de la Plata.*—The Laurel, M'Donald, from London to Valparaiso, put into the river of La Plata, on the 19th of June, 1822, having been obliged to bear up to repair some damage sustained by a heavy sea breaking on board of her. The master reported as follows:—That, on the 15th of June, he discovered a shoal in lat. 36° 28′ S., long. 51° 30′ W.; that it appeared to be about a mile long, and the same in breadth, with a sea breaking very high over it: that it had the appearance of sand, and little water on it. He passed within half a mile, and then hove to; sounded with 90 fathoms of line, and found no bottom. He further states, that he had a good chronometer on board, and was six miles out of his longitude when he made the port of Monte Video.

(according to its strength) than with any other wind; and there is usually, then, a set into the river on the north bank, and out on the opposite. Indeed, whilst the winds are between N. E. and S. S. E., the current generally runs to the westward past Monte Video, though without much augmenting the depth of water off that place, but filling the river above the banks.

"The winds between N. N. E. and W. N. W. make the water lowest: the out-set being then strongest along the south bank of the river, past the Points del Indio and Memoria; but very inconsiderable along the north bank.

"Before the setting in of a S. W. gale, or pampero, the weather is usually very unsettled, and the winds unsteady and variable in the northern and north-western boards, preceded by a considerable fall in the mercury, though it usually rises a little again before the wind shifts to the south-west, and often continues to rise, even though the wind may increase from that quarter.

"Before these winds set in at Buenos Ayres, the current runs up, and fills the river unusually high; at the same time as strong an out-set is experienced along the north bank, which continues whilst the winds are strongest from W. S. W to S., seeming to prove that these winds force up, from the southward, a large accumulated body of water past Cape St. Antonio, which can only find a passage out again by the north shore, where they increase the depth of water, as well as up the river, and particularly in the shallow harbor of Monte Video.* Whilst these S. W. winds blow the air is cold, and the atmosphere clear and elastic, in a degree rarely to be met with in any other part of the world. They are generally succeeded by some days of fine serene weather, the wind continuing moderate from the southward, or varying to the eastward.

"I have never known the velocity of the tide or current, in the River Plata, any where to exceed three knots per hour: but I have heard it said, by some, that they have found it to run at the rate of six or seven miles an hour.

"As the winds outside the River Plata, and particularly about Cape St. Mary, are most frequently from the north-eastward and northward, except when the S. E. summer and S. W. winter gales blow, about the times of new and full moon, I consider it, on the whole, most advisable, for ships bound into the river, to get in with the land about the latitude of that cape.

"In latitude 33° S. the bank of soundings extends off the land full thirty-six leagues, where the depth of water, in longitude 50° 20′ W., is 94 fathoms, and the quality of the bottom dark olive-colored mud, or ooze, as it is all along the outermost verge of the bank.

"In lat. 34° S., and 30 leagues from the land, the bank is steep, and the soundings decrease quickly, in standing to the westward, to 25 fathoms, 20 leagues from land.

"In lat. 34° 20′ S., and long 51° 50′ W., or about 30 leagues east of the Great Castelhos Rock, the depth is 63 or 64 fathoms, dark mud. In standing in for the land, between the Great Castelhos and Cape St. Mary, the water shoals, in a short distance, from 60 to 25 fathoms; and the quality of the bottom changes to sand, which grows coarser as you approach the coast; and, as far as seven leagues off shore, is intermixed with shells. This bottom is found only in, and to the northward of, the latitude of Cape St. Mary, except very close in with it.

"To the southward of 34° 40′ S. the bottom is chiefly mud, intermixed with fine sand or gravel: and if a ship happen to be set to the southward of Cape St. Mary, as she hauls in for the land, yet keeps to the northward of Lobos, she will get out of fine sand into dark mud, which is the quality of the bottom, chiefly, between Cape St. Mary and Lobos, as well as 8 or 9 leagues to the eastward of that island; and the depth of water between them is generally 26 to 20 fathoms.

"In lat. 35° S., and long 52° W., or 42 leagues true east of Lobos, there are about 90 fathoms water, dark sandy bottom; from whence the bank of soundings takes a S. W. direction. East of Lobos, 27 leagues, the depth is 25 fathoms; and, in steering in, on its parallel, the same depth nearly continues till very near that island. But, if set a little to the southward of Lobos, the water will shoal even to 10 fathoms, perhaps, on a hard sandy or gravelly ridge, that extends all the way from the English Bank, in its parallel, as far as long. 52° 30′ W.; or full 18 leagues to the eastward of the meridian of Lobos.

"Thus the approach to this river cannot be considered dangerous, if proper care be taken in navigating, and due attention paid to the lead, and to the course steered.

"I shall here insert the honorable Capt. Bouverie's description of Cape St. Mary, &c., which I believe to be very correct, and his directions judicious.

"Cape St. Mary is a low point, with rocks all about it. The direction of the coast, to the westward of this cape, becomes more westerly than at any other part northward of it. About six miles northward of it is a house, with a row of trees northward of the house, (probably a fence of high prickly-pear bushes,) which is very remarkable.

"About a mile south of the house is a bluff point, with a few rocks at the foot, which

* There is a light-house at Monte Video, the lantern of which is four hundred and seventy-five feet above the level of the sea.

is remarkable, being different from the rest of the coast, the general character of which is a sandy beach, One cannot fail of knowing the cape by these marks, running down the coast near it. If you are at any distance off, you will not perceive them. The water off Cape St. Mary is shoaler than to the northward. Off the cape, in a S. E. direction, you have 8½ fathoms at the distance of 4 or 5 miles."

I am inclined to think Capt. B. may have been somewhat deceived in his estimation here; for, in his Majesty's ship Nereus, I found more water at the distance he mentions. On the 17th of November, 1810, at noon, in lat. 34° 42′ S., and long. about 2° 20′ E. of the Monte Video, had light winds from S. by W., and fine weather. At half past 1 P. M. tacked in 23 fathoms, to stand in shore, and carried from that depth to 18 fathoms, when sights were taken for the chronometer, which made 2° 13′ 21″ east of Monte Video, Cape St. Mary bearing N. 66° W., and standing on, laying up W. and W. by N., tacking in 12½ fathoms water, the prickly-pear hedge, (mentioned by Captain Bouverie,) being on with Cape St. Mary, (which is formed by a low rocky islet nearly joining the shore, (bearing north by compass, and the breakers stretching to the S. E. of the cape; N. 7° E., about 3 miles, was our distance from the cape.

Captain Bouverie, in continuation, says, "To the northward of the cape, between it and Palma, you have 10 or 11 fathoms at a little distance from the shore.

"Ships in general make the land with N. or N. E. winds: therefore, it is best to keep in the latitude of the cape, or a little to the northward of it, till you get soundings, as the current sets to the S. W. It is better not to make the land north of the cape, not that I believe there is any absolute danger, but the water in many places is shoal a long way off the land, and would alarm any one not acquainted with that circumstance.

"In lat. 33° 27′ S., and long. 52° 9′ W., is a shoal, where we found 9 fathoms water. I believe it is a ridge running in that parallel of latitude all the way to the shore. In latitude 34° S. is some tolerably high land, on which is a Spanish fortress, called Fort Teresa. It is a square, with bastions at the angles. It has three guns in the face and one in the flank, and stands about a mile from the beach. About 6 leagues N. N. E. from it is a mark set up, as the termination of the Spanish territories.

"Being in latitude of Cape St. Mary, and having got ground in 28 or 30 fathoms water, fine sand and shells, you may reckon yourself 20 leagues off shore; with from 15 to 20 fathoms, sand and clay mixed, you are not far off the land. When you have not seen the land before night, be sure to keep to the northward of the cape by your reckoning, to allow for the current, which sets to the southward. This is the case with the above mentioned N. and N. E. winds. With S. and S. W. winds the current runs strong the other way.

"I am inclined to think that the strong north-easterly currents which are to be met with off the mouth of the Plata when the wind is about to blow, or blowing, from the south-westward, do not extend much, if at all, beyond the bank of soundings.

"Agreeing in opinion with Captain Bouverie, that, generally speaking, it is advisable to make the land about Cape St. Mary, I would also recommend, if the wind should be any where between S. E. and N. N. E., to enter the river on the north side of the English Bank, passing Lobos, on either side, according to the wind and state of the weather. There is a good passage between Lobos and the main, having 17 to 14 fathoms water, Variation 13° easterly, (1813.)

"When within 3 or 4 leagues of Cape St. Mary, in 17 or 18 fathoms, S. S. W., by compass, is a fair course to steer for passing outside of Lobos in the night time; for, with the wind from the eastward, or N. E., the set along shore into the river must be guarded against. Steering this S. S. W. course, the depth of water will increase to 20 and 22; and some casts, perhaps, of 24 or 25 fathoms, (if you are set neither to the westward nor to the southward of it,) and the bottom will change, first to sandy mud, and then to dark blue mud, as you approach the latitude of Lobos. If you are set to the southward, in steering S. S. W, you will not deepen so much. The bottom will keep sandy; and when you approach the latitude of Lobos, you will have no more than 19, 18, and 17 fathoms; but if you are set to the southward of Lobos a few miles, you will have hard casts of from 16 to 10 fathoms, and may rest assured of being on the parallel of the English Bank, and may, therefore, make a west northerly course, true, till you find the bottom soften, as it is all dark blue or greenish mud in the channel, between the foul ridge of the English Bank and the north shore, all the way up to Monte Video, in the fair way from Lobos. When off Lobos, if the weather threaten, and it should be likely to blow, a ship will find safe anchorage in the harbor of Maldonado, sheltered from southerly winds by the Island of Goritti, which bears N. 42° W., true, 11 or 12 miles from Lobos. As I have never been in Maldonado myself, I shall insert here what Captain Bouverie says about it.

"The Spanish surveys of this bay lay down a sufficient depth of water for any ship between any part of the island and the main; however, it cannot be safely entered, but by small vessels, except to the westward; and you must not go farther in than to bring the N. W. point of Goritti to bear S. S. W. ½ W., or S. W. by S., by compass, with 4½

or 5 fathoms, good strong clay. With southerly winds there is, in the east passage, a heavy swell; and the water, from the ground being uneven, breaks almost the whole way across in bad weather. The Diomede, (fifty-gun ship,) passed through it to the anchorage before its dangers were known, and had not less than 18 feet; but there are places where there is so little as 1½ fathom; and it is very irregular. There is a bed of rocks to the south of Goritti: the marks for it are, the Tower of Maldonado north, and the outer part of Point del Este E. N. E. ½ E.

"In the direct line of the entrance of the bay, from the westward, is a bed of rocks where there are parts having only 3 and quarter less 3 fathoms. The bearings, taken on the rocks are, N. E. point of Goritti, E. ½ S.; N. W. point of ditto, E. by S. ½ S.; S. W. point of ditto, S. E. by S.; Point Ballena, W. by N. ½ N.; the hill of Pan de Azucar, just within the extreme of Point Ballena.

"In mid-channel, between these rocks and the island, are 6½ and 7 fathoms. Their distance from the island is about three-quarters of a mile. There are 7 fathoms close to them, all round the western side. The watering place is on the main, close by a battery. The stream loses itself in the sand, except when swollen by heavy rains, and you have to roll your casks about 60 yards over the sand. The water is very good.

"Having Lobos bearing N. by W., by compass, distant 3 or 4 miles, you will have about 18 fathoms; and, in making a compass course, W. ½ S., by ground-log, (having due regard to the wind and current at the time,) you will make the Island of Flores ahead of you. In this track your soundings will gradually decrease from 18 to 12 fathoms due south of Black Point, and to 7 or 8 fathoms when you approach within nine or ten miles of Flores.

"Though Captain Bouverie says, 'You may run quite up to Monte Video, either by night or day, by making a due west course, first trying the current to make allowance for it;' and, though I have frequently done it myself, yet I would not recommend it as a general rule to be followed by strangers to the River Plata. Great care and attention to the course made good, and to the soundings, are indispensably requisite in those who attempt to conduct vessels during the night, in any part of this river; and even these have been but too often insufficient to save ships from destruction. But, in merchant vessels, I fear we cannot always expect to find those qualities; and, therefore, I withhold my opinion of its being advisable for them to run in the night; neither can it be done by men-of-war, without some risk.

"Flores bears, by the world, W. 4° 30′ N. from Lobos, distant 52 miles. It lies nearly N. E. and S. W., has a small hummock in the middle, and one at each end; that to the S. W. being 39 feet high. Between these the land is low and marshy, and overflowed sometimes between the central and N. E. hummock. It may be seen at the distance of 5 or 6 leagues from a ship's deck, in clear weather.

"There is good anchorage all round this island, but a reef extends in a N. W. direction from the north point about a mile. Seals and sea lions, and various aquatic birds resort to the small islands as well as to Lobos; and in the months of August and September great quantities of very excellent eggs may be procured. With the wind easterly, boats may land on the western side of Flores, particularly in a small cove very near the S. W. part of the island. From Flores, W. N. W., the Caretas Rocks (above water) are distant about 5 miles, and there are 5 fathoms between them. The south, at the distance of 11 miles from Flores, is the north part of the English Bank, on which, in that latitude, 35° 8′ S., there are about 12 feet water. The depth of water between Flores and the English Bank is 7 fathoms all the way across, to within a very little distance of both. The English Bank, in lat. 35° 12′, generally breaks, and, with a low river, is above water in some places. Its extent, to the southward, has not yet been accurately defined; and for 70 or 80 miles to the south-eastward of it the ground is said to be foul and uneven, and has not been explored.

"Between the Archimedes and the English Bank there is a swatch of 5 fathoms water, (according to Capt. Beaufort, of the Royal Navy, who explored these banks in 1807,) and as many miles wide.

"The shoalest part of the Archimedes Bank, about 2¾ fathoms, is 4 miles in extent, about north and south, and there are 4 fathoms all round it. The centre of it is in latitude 35° 12′ S., and the Monte Video bears N. 22° W., by the world, from it, distant 20 miles. Besides this bank, there is a small knoll, in lat. 35° 14′ S., which is true S. from the Monte Video, 21 miles, and has not more than 3½ fathoms of water on it, and about 4 fathoms all round it.

"Passing to the southward of Flores, at the distance of a couple of miles, you have 6½ or 7 fathoms, and may steer W. ½ S. to pass Point Braba, which bears true W. 4° N., distant 4 leagues from the S. W. end of Flores. This point is bolder to than the land to the westward, between it and the town of Monte Video, and may be passed close, in 4½ or 5 fathoms, at a mile or a mile and a half distant. The best anchorage for a frigate off the town of Monte Video, is with Point Braba bearing W. by N. ½ N.; the

cathedral N. E. by N.; and the mount about N. W. by N., in 3½ and 4 fathoms, 2 miles or more from the town, with the harbor quite open. The bottom is all soft mud.

"The harbor of Monte Video is very shoal, having only from 14 to 19 feet water; but the bottom is so very soft that vessels receive no damage by grounding there. Captain Bouverie says, 'A S. S. W. wind, which blows right into the harbor, and causes a good deal of sea, always occasions the water to rise a fathom or more.'

"In a long continuance of fine weather, the tides sometimes assume the appearance of regularity; but this is not often the case. They are governed entirely by the winds. The winds from the southward cause the water to run out on the north shore strongest. Fine weather and a N. W. wind make the water lowest. It is usual, in Monte Video harbor, to have an anchor to the S. E., and another to the S. W., and to take one in abaft from the northward; for the water, forced in by the southerly wind, sometimes rushes out with astonishing rapidity; when the anchorage to the north is of the greatest service.

"The Monte Video is in latitude 34° 53′ S., longitude 56° 3′ W. of Greenwich; being 1° 24′ W. of the Island of Lobos, and 2° 10′ E. from the cathedral of Buenos Ayres. On the summit of this mount is a fortified building, whose base is 42 feet 6 inches by 20 feet, used sometimes for a light-house.* The diameter of the lantern is 10 feet 6 inches, and its elevation above the level of the sea 475 feet. At the base of the mount are several runs of excellent water, particularly in two small, smooth, sandy bays, on the S. W. part of it, where ships in the outer road may supply themselves with ease; and another on the east side of the mount, just abreast of Rat Island, adapted to ships in the harbor.

"Giving the preference to the passage on the north side of the English Bank, especially when the wind is any where between S. S. E. and N. N. E. on passing Lobos, because it may be expected most probably to shift, if it does at all, round by the north to the westward; though, perhaps, not before that wind, and the inset, together, might carry a ship up to Monte Video; yet if the wind should be to the north-westward at the time of making the land, it may be pretty confidently expected to shift next to the westward or S. W., and therefore a ship should not strive to beat up round Lobos and the north channel, against an outset, but stand at once over towards Cape St. Antonio, where, by the time she could stretch across, she would, most likely, find a S. S. W. wind and N. W. current to run up with, along a weather shore, to Buenos Ayres, or to Monte Video, if bound thither, passing to the westward of the Bank of Archimedes, in about 5 fathoms water; or, if the mount should be seen in good time, never to bring it to bear to the westward of north, till within 5 leagues of it.

"In standing to the southward from abreast of Cape St. Mary, with the wind southwesterly, a ship will have from 18 to 24 or 25 fathoms when in the latitude of Lobos, and about 12 or 13 leagues to the eastward of it; and, making a S. S. E. course, the water will then shoal to 18, 16, 12, or 11 fathoms, in crossing the ridge, which is generally composed of sand, grey speckled, mixed with stones, hereabouts; after which the depth increases gradually to 35 or 36 fathoms, over a sandy bottom, in latitude 35° 40′ S., and longitude 53° 25′ W. In the latitude of 36° S., and 15 or 20 miles farther to the eastward, you will deepen off the bank entirely. A ship having got as far to the south as 36° S., may consider herself in the fair way for proceeding up on the south side of the English Bank; and, if the wind serve, a true west course may be made good.

"In latitude 36° S., the depth of water on the meridian of Cape St. Mary is 38 fathoms, and the bottom fine grey sand, like ground pepper.

"Keeping still to the westward, on that parallel of 36° S., the depth decreases to 19 or 18 fathoms, true, south of Lobos; and for 10 leagues farther you have from that to 15 fathoms. But if from the latitude of 36° S., on the meridian of Lobos, you make a W. by N., or W. by N. ½ N. course, true, you will shoal the water to 8 or 7½ fathoms, in latitude 35° 45′ S., on the meridian of the English Bank. The quality of the bottom, generally, in this track, is sandy, mixed with small stones; and the nearer you approach to the ridge of the English Bank, it is intermixed with bits of shells, and sometimes with clay or mud.

"From latitude 35° 45′ S., due S. of the English Bank, a W. N. W. true course to latitude 35° 33′ S., will bring Monte Video to bear N., by the world, in about 6½ fathoms, mud, at the distance of 13 leagues from Point Piedras; and from this position the same true course may be made to raise the land about Point del Indio, if bound up to Buenos Ayres; or N. W., or more northerly, to get sight of the Monte Video; having due regard

* A lantern, with lamps and reflectors, for Monte Video, was prepared in London, by order of the Portuguese government, and shipped in May, 1819. It was then stated that the light-house was to be erected on the Isle Flores; but on the 26th of October following, an official notice was issued from the British Admiralty, stating that "the light-house, which formerly stood upon the mountain Monte Video, had been re-established, and is to be lighted every evening." The light has, therefore, been materially improved.

to the set of the current, up or down the river, that you may neither be horsed on the S. E. tail of the Ortiz Flats, nor on the western part of the Archimedes Bank. The bottom above this is soft mud, or clay, in the channels, fit for safe anchorage. In latitude 35° 30′ S., or thereabouts, and due south of the Archimedes Bank, or some miles farther to the eastward, I have been told by some persons they have had as little as 4 fathoms, hard ground.

"Ships leaving Monte Video, to proceed up to Buenos Ayres, must be very attentive to the lead; and the course steered across the river must be very carefully regulated by the set of current at the time. If the weather be sufficiently clear, the mount is the most sure guide, keeping it by an azimuth compass; on the magnetic bearing N. E. by N.; and when it sinks to an eye in the top, a more westerly course may be steered to raise the land about Point del Indio. This direction is intended to apply particularly to frigates, or any ships drawing more than 16 feet water; because it is not advisable for them to cross the tail of the Ortiz Flats much farther to the westward than a true S. W. course from the mount will take them; for, with a low river, I have had barely 3¼ fathoms, in the Nereus, with the mount bearing N. 35° E., by compass, distant 10 leagues. At other times, I have sunk the mount on a N. 53° E. magnetic bearing, and had as much as 3½ fathoms water; but the river was then well filled.

"The Ortiz Bank extends from lat. 34° 25′ S. to lat. 35° 15′ S. Ships passing between the Ortiz and the south shore, have only to keep the land in sight, to clear the bank. On the Chico Bank (the smallest of the Ortiz, and the most southern,) there is the wreck of a vessel, the mast of which serves as a beacon, lying about 12 miles east of El Embudo, and 8 or 10 miles west from the S. E. buoy on the Ortiz, and may be passed on either side, as there are 3 fathoms very near it all round, and also four buoys. There is a good passage between the Ortiz Bank and Chico, with nothing less than 4 fathoms; the Ortiz side is the deepest.

"Soundings on approaching the south side of the Ortiz Bank are regular, and shoalen gradually. When you get hard bottom, keep off a little and deepen into 3½, 4, or 5 fathoms, soft mud. The approach to the Chico is not safe on the Ortiz side, as you get from 5 into 2 fathoms directly, in some places, which makes it safest to keep on the Ortiz side of the middle passage. The middle passage is soft mud until very near the banks; the passage betwen the Chico and the shore is for the most part soft mud, but in many places it will change suddenly, and appears to be formed of hard and soft ridges alternately. You will carry 5½, 5¾, and 4 fathoms in the channel, and the passage is from 4 to 6 miles broad. Tides rise in the river about 5 feet in settled weather.

"For the distance of full 17 miles to the south-eastward of the Ortiz Beacon there is generally no more, and often less than 3½ fathoms; the bottom tough clay nearest the bank; and in some places farther to the south-eastward, soft mud, not more than 3¼ fathoms.

"After sinking the mount about N. E. by N., and having 3½ fathoms, a W. S. W. course will raise the land (if the weather is clear) about Point del Indio to the eye at the masthead; and probably you will not have more than 3¼, or at best, 3½ fathoms. The mount and land near Point del Indio are sometimes visible at the same time.

"Point del Indio is in latitude about 35° 16′ S., and 0° 56′ W. of the Monte Video, from which it bears S. 63° W., by the world, distant 50 miles. There is little more than 3 fathoms at the distance of 10 or 11 miles, when the river is in a mean state; farther to the southward, and off Point Piedras, there is only that depth 14 or 15 miles off shore. Very great caution, therefore, is required in approaching it; and a constant lookout should be kept for the land, as it is very low, and cannot be seen farther than 12 or 13 miles, in any weather, from the deck of a frigate.

"When the land is barely raised to an eye 19 or 20 feet above the surface of the water, a W. N. W. magnetic course will lead along shore, between it and the south part of the Ortiz, which is distant about 14 miles from it; and between them there is no where more water than 3½, but mostly 3¼ fathoms. With a high river, I have had a quarter less 4 fathoms. The nearer the Ortiz, the deeper the water.

"In steering up W. N. W., with the land seen from the deck, (if clear weather,) you will have 3½ or 3¼ fathoms, yet if the river is low, perhaps some casts of 3 fathoms, and raise a remarkable clump of trees, called Embudo, which are much taller than the rest, highest at the west end, and lie in lat. 35° 6′ S., and in long. 1° 16′ 30″ W. of the Monte Video, or 57° 30′ E. of the cathedral of Buenos Ayres. At some distance to the westward of the Embudo trees, there is another clump about the same height; but these being highest at the east end, are sufficiently distinguished not to be mistaken for the true Embudo.

"When in 3½, or 3¼ fathoms, the Embudo trees bear, by compass, W. S. W., the S. E. end of the Chico Bank will bear W. N. W., or thereabouts, 10 or 11 miles from you; and you must now determine from the water that your ship draws, and the then direction of the wind and state of the weather, whether you will pass between the Chico and the shore, or between the Ortiz and the Chico. I have passed up and down several

times between the Chico and the south shore in the Nereus, lightened in her draft to 18 feet 3 inches; but I would never attempt it again from choice, now I am better acquainted with the middle channel between the Chico and the Ortiz, and have every reason to believe that the middle ground some charts lay down in it, does not exist.

"A ship not drawing more than 15 feet may take either passage, and, of the two, ought perhaps to prefer that to the southward of the Chico Bank, particularly if the wind should be well to the southward, as she might take her soundings from the weather shore, and keeping in somewhat more than her own draft, run up along it, and by not deepening above 3 fathoms, would ensure being to the southward of the Chico.

"The S. E. end of the Chico Bank bears from the Embudo trees N. 32° E., true, distant 10 miles, and E. 9° N., 13 miles from Atalaya church. Its latitude there is 34° 56′ 30″ S., and longitude 1° 9′ W. of the Monte Video. This bank runs in the direction of N. 52° W., true, or N. 65° W., by compass, about 13 miles to its N. W. end, which is in latitude 34° 48′ 50″ S., and 47′ E. of Buenos Ayres cathedral. From this N. W. end, in 14 feet water, Atalaya church bears S. 14° W., distant 11 miles; and Point Santiago, forming the Ensenada de Barragan, bears W. 4° N., 14 miles from it. The breadth of the Chico does not exceed 2 miles, or perhaps a mile and a half, and its inner edge is about 9 miles from the shore. The water between it and the shore is no where more than 3½ fathoms, and the deepest water is along the inner edge of the shoal, at the distance of half a mile from it, or less in some places. About midway between it and the shore there is a quarter less three fathoms. On some parts of the Chico there is very little water, and within the limits I have assigned to it, no more than 14 feet. There was, for some years, the mast of a vessel called the Pandora, which was wrecked on this shoal, in lat. 34° 54′ S., about 5 miles from its S. E. end, which proved an excellent beacon to guide ships passing it on either side; but it has disappeared. It is very necessary that three buoys should be placed on this dangerous shoal, to mark its centre and each end.

"To ships drawing less than 15 feet, it is only further necessary to recommend care and attention on approaching Point St. Iago, which forms bushy and distinct; and when it is brought to bear to the south-westward, haul out into the stream of 3½ fathoms, to round outside the spit, which runs about N. W., by compass, from Point St. Iago at least 10 or 11 miles; its extreme point, in 2 fathoms, being 5 miles from the shore. When two remarkable trees on Point Lara are brought to bear S. by E. ½ E., or S. S. E., by compass, you are past the spit. This mark will also lead a ship of that draft of water clear to the westward of the spit, in running in towards the Ensenada.

"After passing the spit of Point St. Iago, in 3½ fathoms, a W. by N. northerly course, by compass, will lead up to the outer road of Buenos Ayres, where any ship may safely anchor in the water she draws, if the river is low.

"Frigates, or any vessels drawing more than 16 feet water, should barely raise the land about Point del Indio to the eye on deck, and borrow nearest the Ortiz; more particularly when the Embudo trees are brought to bear as far as S. W. by W., (magnetic;) for, with the Embudo bearing from S. W. to S. S. W., the bottom is flat, off to 3 fathoms, full 7 miles from the shore, and chiefly hard clay. Therefore, when the Embudo trees bear W. S. W., by compass, and you are about 9 or 10 miles off shore, in 3½ fathoms, if you have a leading wind, haul to the N. W. by W., or more northerly; as may be required to clear the S. E. tail of the Chico, on which a red buoy is placed, and you will soon deepen your water to 4 fathoms, and more in the middle channel, between the Chico and the Ortiz Shoal. The fair course through, between them, is about N. W. by W. ½ W., (magnetic,) and in mid-channel the land can just be distinguished from the quarter-deck of a frigate. When the Embudo trees bears S. 20° W., by compass, you will be abreast of the S. E. end of the Chico, and may either take your shoal soundings along its northern or outer edge, to about a quarter less four, if the wind is southerly, or if the wind be northerly, or easterly, borrow into a convenient depth along the southern edge of the Ortiz. I believe the breadth of this middle channel may be five or six miles, and the depth of water from 4 to 5½, and even 6 fathoms, in the fair-way, about the N. W. part of it, and abreast that end of the Chico. The quality of ground all the way through this channel is generally soft mud, and fit for safe anchorage.

"The N. W. pitch of the Chico Bank, on which is a red buoy, as before mentioned, being passed, and the depth of water 5 or 5½ fathoms, you may steer by compass W. by N. ½ N., or W. by N., for Buenos Ayres, taking care not to shoal under quarter less four off *Ensenada, till Point Lara trees bears S. S. E. A little more than half way from Point Lara to Buenos Ayres there are two other remarkable trees. When moored off Buenos Ayres, in the Nereus, in 19 feet water, and the bottom soft mud, these trees bore, by compass, S. 17° E., the cathedral S. 67° W., and the spire of the Recoleta Convent, S. 76° W. Variation 12½ E.

P. HEYWOOD."

* There is a good harbor at this place.

THE RIVER PLATA TO CAPE HORN, FALKLAND ISLANDS, SOUTH SHETLAND, &c.

The coast of the Pampas, or plains of Buenos Ayres, extends from the River Plata to the Colorado or Red River, represented in lat. 39° 50′ S. It is entirely flat, and destitute of harbors. The interior is one vast plain, mostly covered with grass and clover, the food of millions of horned cattle. The maritime part, next the sea, has been called by the Spaniards the Pays del Diable, or Devil's Country, (no very attractive appellation,) yet the coast may be approached with safety, as the soundings are regular.

ARIEL ROCKS.—Coast of Buenos Ayres, lat. 40° 1′ S., long. 57° 37′ W. Rocks supposed to be above water.

Extract from the log-book of the schooner Ariel, of Whitehaven, Thomas Dixon, master, on her passage from Liverpool to Valparaiso, Dec. 22, 1827:

"At 11 hours 45 minutes A. M., moderate breezes from the N. E., steering S. S. W., by compass, saw something of a reddish appearance, a little above water, at about a quarter of a mile distant. Hauled in for it, sounded, and obtained bottom at 47 fathoms, fine grey sand. The object seen was about 6 feet above the water, and 20 or 30 feet in circumference, but more extensive underneath. When close to, we saw another head, at about 2 or 3 cables' length to the N. E. of the first, also of a reddish appearance. The sea was breaking over them, with a noise. There was some sea-weed, and a number of sea-birds about them. These rocks lie in the general track of vessels round Cape Horn, to the west coast of South America. The latitude was obtained by a good meridian altitude of the sun, and the longitude, by good lunar observations taken that day, and by chronometric observations. TH. DIXON, Master."

RIO NEGRO.—In coming from the eastward to Rio Negro, the navigator should endeavor to make the land in about the parallel of 40° 52′ S., and longitude 62° 15′ W., when he will first see Point Raza, which will be readily known by three remarkable hummocks. After approaching to within one league of this point, he may steer southwest towards Rio Negro, taking care not to come into less than 6 or 8 fathoms water, with a sandy bottom. The shore is a continuance of low sand hills, interspersed with heath and brushwood, until you approach the river, where the hillocks become more elevated, and are composed of clean white sand, lying in ridges or undulations, like the waves of the ocean.

About 4 or 5 miles south of Point Raza, is a singular hillock of brushwood, having small shrubs towards the east end, which from the sea appears like a drove of cattle. Eight miles to the south and west of this, is a remarkable gap, about 2½ miles back of the beach. As you approach the entrance of Rio Negro, the range of white sand hills will terminate, and the mouth of the river bearing W. S. W., appears high and bluff on Baranca, which is high and bluff, terminating in a perpendicular point, and this point is a table land, for 4 or 5 miles to the westward.

To enter the Harbor of Rio Negro, without a pilot, the south-east channel is to be preferred; and you must keep along in 4, 5, or 6 fathoms of water, until you bring Point de Maine to bear N. W. Then steer for the mouth of the river, observing to keep Point Welcome, which is a remarkable bluff promontory, about 10 yards open of a low point off the pilot's house. These marks are distinctly seen, when Point de Maine, the eastern point of the river, bears N. W. But beware of the flood tide, which sets strong over the north bank; and if your vessel draws more than 10 feet of water, you must not attempt to enter until three-quarters of flood, when you will have from 2 to 2½ fathoms of water between the banks, which will deepen as you approach Point de Maine. The breakers on the bank are distinctly seen, and with a southerly wind it frequently breaks all round the channel. Having passed through between the north and south banks, you will find 4, 5, and 6 fathoms of water, but you must be careful and keep the eastern point on board until you are inside of the point of the borras; by which means you will clear the inner bank, which extends two-thirds of its length outside the harbor's mouth. In this river, at the town, there are about two hours flood tide, and commonly about ten hours of ebb tide, frequently running at the rate of five or six miles an hour. But within the mouth of the river the flood runs four hours, and the ebb tide eight hours, at the rate of three and a half miles an hour. It is high water at the bar, on the days of new and full moon, at a quarter past 11; and the water rises there 11 feet on the spring tides, and 8 feet on the neap tides; but when the wind blows strongly from the S. E. the tide rises from 12 to 14 feet. There is a regular tide along the coast, 6 hours flood and 6 hours ebb, but the flood tide inclines rather towards the shore, about N. E. by N., at the rate of 2 or 3 miles an hour. Consequently, in entering the Rio Negro, particular attention must be paid to the currents and tides which set strongly to the N. E. round the Point de Maine.

In this river, refreshments of all kinds can be procured.

FALKLAND ISLANDS, the Maluinas of the Spaniards.—These islands have borne different names, successively imparted by the older navigators. Recently they have been taken possession of, in a formal manner, as belonging to the United Provinces of South America. And, on account of some outrage committed by the settlers on American vessels, the settlement was broken up by the U. S. sloop-of-war Lexington, in the year 1831. Since then they have been taken possession of by order of the British government.

The islands and islets, in general, appear equally bleak and desolate, presenting barren shores and naked limestone mountains, with no other vegetation than heath and grass. In the low grounds a stratum of peat, 2 feet thick, covers a bed of stone or slate. The quadrupeds are wolves and foxes, which earth themselves alike. Seals and sea birds are innumerable. The advantages of the islands are their excellent harbors, a climate commonly temperate and healthy, but subject to great vicissitudes. The running waters are abundant. Though the islands have no wood, there is no want of fuel, the peat affording it in abundance. Large quantities are sometimes found, which appear to come from the south and west.

Our information with regard to the islands is yet imperfect. The positions in the table are, however, given as nearly as we could obtain them. We believe that they are very near the truth, especially in the western points.

Lieutenant Grant, commander of the Lady Nelson, in the relation of his voyage to New South Wales, has given some useful remarks on these islands. He states that, on the 21st January, 1802, having before intended to touch at these islands, they came safely to an anchor in Hope Bay, or Little West Point Harbor, in the N. W., and then proceeds as follows:

"Our intention had been first to touch at a cluster of islands to the westward, called New Islands by the Americans, who are the most constant visitors of Falkland's Islands. On New Islands are found plenty of goats and hogs. They lie about 30 miles S. S. W., by compass, from West Bay, as a N. N. E. course carried us from them clear to the the entrance of West Point. They are distinguished by a particular saddle island and a bluff, standing separately from each other. They are a little to the northward of Beaver Island, and may be easily found by the two remarkable islands just mentioned.

"As it is of the greatest consequence to mariners, when in want of water or refreshments, to obtain every possible information in order to secure a port amongst this foul-weather group of islands, which purpose may be defeated by the smallest oversight, I think that a few remarks made in the run may not be unacceptable.

"Having made New Islands, the westerly wind, which generally prevails, blowing very strong, and in squalls, would not permit us to anchor. We were, therefore, under the necessity either of making the harbor of West Point, or running in the night through a passage among the Jasons, well known to be full of rocks and shoals, many of them not laid down in any chart. I have before observed, that 30 miles N. N. E., by compass, brought us to the entrance of West Point Harbor. In this run there are, on the right hand, a few small flat islands, called Pass Islands. These ought to be kept on board near enough to see the surf breaking on them; and soon after a remarkable island, with a steep side, will present itself, having the appearance of a split in the middle, which has given it the name of Split Island. Here we observed the latitude, at noon, to be 51° 14′ south, when it bore E. N. E., by compass, distant three miles. The split must be brought to bear south by west in running in, and north by east in coming out. Observing this, a vessel will find itself in the fair way; and right ahead in coming in, or right astern going out, a sight will be had of West Point entrance, making at first like three hummocks, to the right of which is the mouth of the harbor. The small harbor on the left is preferable to the larger one on the right, though anchorage may be found in both, but fresh water may more readily be had in the little harbor. Both these together form nearly an oval, divided by the passage which runs directly through, where the tides of flood and ebb alternately enter. A vessel must, therefore, haul close round the rocks on the south side, to get into the little harbor for the ebb tide, with which she must go in, unless it blows very strong, so as to enable her to stem the flood, both tides running here with great rapidity, and when it blows hard, raising a confused sea. There is a sandy beach at the top of the harbor, off which a vessel may choose her depth of water to anchor in. In going out of the harbor, the northern passage is most eligible; and a westerly wind, with a course N. by E., by compass, will carry a vessel out, provided she get under way at the first of the ebb.

"Five small perpendicular rocks, called the Needle Keys, appear when out, standing together, bearing N. E. by E., or thereabouts, from the harbor's mouth. It is best to leave them on the right; but should there be little wind, and the tide strong, as was the case when we passed them, a vessel may go close to the right of them. The tide must be attended to, as it runs strongly betwixt them. The water close to them is very deep, as we were carried by the tide near enough to throw any thing upon them. The bottom is very foul, so, that if an anchor is let go, it is a chance if it is ever recovered; and should the wind continue light, the tide of flood making, a vessel may anchor at Sedge

Island, if she can get as far down, where 10 fathoms water will be found, with a sandy bottom, within 2 or 3 miles of the shore. From Sedge Island a N. by E. course will carry a vessel clear out to sea.

"It is proper to observe here, that if a vessel is obliged to leave the Needle Keys on her left hand, the nearer she keeps to them the better, and even to haul over on the larboard side after she is past, as she will have the more room to weather a ledge of rocks lying at a considerable distance out from Saunder's Point. This passage is much preferable to running through the Jasons.

"Falkland's Islands have been described by many voyagers, whose stay there gave them better opportunity of observation. I shall just observe that they lie very convenient for being touched at on long voyages, when there happens such a necessity for a supply of sea stock as we experienced.

"The soil is light, producing a strong grass, known by the name of tussack, which, if set fire to, the turf will burn for a considerable time; and notwithstanding heavy rains, it is not to be extinguished. I saw but little timber, and even brushwood did not appear to be in plenty. Few birds are to be seen, but geese and penguins are in great numbers.

"We found the geese excellent eating, without the least taste of fish, as they live on grass and sea-weed. Celery was found growing plentifully. We used it freely, as its anti-scorbutic virtues are well known.

"We found an American ship lying here, called the Washington, of Nantucket. Her commander, Jedediah Fitz, informed me that the American sailors have discovered potatoes eaten raw to be a powerful anti-scorbutic, and that their whaling vessels constantly took a quantity with them to sea, to eat raw, as an antidote against the scurvy. He had planted a garden here, as was the custom with vessels visiting this place, and he brought some potatoes fresh dug from it, which he recommended me to taste, after setting me an example. I complied, and must say that I have before taken a more unpalateable medicine. He made use of the young leaves of the common dock, boiling them as cabbage, to eat with his meat. He stripped the leaf from the rib, or stem, in the middle, which he said had a purgative quality. He made no use of the celery, as he thought the dock was preferable to it. I dined with him on board his ship, when a dish of the latter vegetable was served upon table, and upon eating, I thought its tase not unpleasant."

It is to be observed that the Eastern, or Little Island, has never yet been regularly surveyed, and its true figure is yet unknown. Many dangers, not yet laid down in the charts may, therefore, exist in the vicinity. Of this there has lately been a signal example, in the sudden loss of the French sloop Uranie, which was wrecked on the 13th of February, 1820, by striking on a sunken rock near the mouth of French Bay. This vessel, commanded by M. Freycinet, was returning from her voyage around the world. She had been driven by a dreadful storm from Good Success Bay, in Tierra del Fuego. Happily, her people and stores were saved, by an American, which happened to be near the spot. The account of this accident is so vague that we cannot gain from it the position of the rock, but it is clear that by French Bay is meant the Berkeley Sound of our charts.

Captain Barnard, who was inhumanly left in those islands, where he was a long time resident, by the master and crew of a British vessel, whom he took off a wreck, states that all the dangers with which he is acquainted, (with the exception of the rock on which the Uranie was wrecked, are covered with kelp;) and, as a rule, all the kelp is to be avoided. Captain King, of the R. N., has given some valuable remarks on kelp, in his survey of Tierra del Fuego, republished in this volume, to which we refer the reader.

Mr. Wm. Marsh, of the brig Nancy, 1813, has favored us with a rough sketch of the Maluinas, by which it appears that there is a group of isles at the S. W. end of Soledad, or the Little Maluina, which forms a convenient harbor, the track to which is denoted by the chart. Kelp Bay, to the eastward of this group, is full of weeds.

The late Capt. John M'Bride, of the Royal Navy, kept a regular journal of the winds and weather at the Falkland Islands, from 1st of February, 1766, to 19th January, 1767, which was published in 1775, by Mr. Dalrymple. The journal concludes with the following general remarks:

"From looking over the foregoing journal of the winds, for the space of one year, they will be found to prevail in the western quarter, and generally blow a close reefed topsail gale, with a cold air. In November the winds begin to be more frequent in the N. W. quarter, generally hazy weather, and for the most part blow about 16 or 20 hours, when it begins to rain. The wind then regularly shifts into the westward, and so on, till it gets to the S. W. by S., and S. S. W., when it blows fresh, and clears up. This S. S. W. wind continues for about 16 hours, then dies away, when the wind shifts again to the N. W. quarter. This continues during December, January, and February, and changes in the manner above mentioned, every three or four days. As March comes on, you have these changes but seldom, and as the winter advances, they are seldom in the N. W. quarter, but rather incline to the E. N. E., which is generally accompanied

with sleet and snow. There is not the least proportion in the gales between winter and summer. In summer, (as I have before observed,) as the winds are in the westward, they blow in such heavy squalls off the tops of the mountains, that it is sometimes an hour before a cutter can row to the shore, although the water is smooth, and the distance of but one cable and a half off. In winter the winds are pent up by a keen frosty air. The most lasting gales are those from S. by E. to S. by W., and are extremely cold."

In January and February, the thermometer several times rose to 59°, but no higher. In August, it once fell to 20°, but was seldom lower than 32°.

Of the isles, in general, Captain M'Bride said, "We found a mass of islands and broken lands, beaten by storms almost perpetual. Yet this is summer; and if the winds of winter hold their natural proportion, those who lie but 2 cables' length from the shore must pass weeks without having any communication with it."

BERKELEY SOUND is the Puerto de la Soledad of the Spaniards; and it would, perhaps, be more proper to give it that designation. It was at the N. W. part of this harbor that the French, under M. de Bougainville, had their settlement in 1764, as noticed above. A particular plan of it is given in the journal of the voyage, by which it appears to be more than a league wide at the entrance, extending east and west 3 leagues, to four islands which lie in the inner part of the harbor; three on the north, and one on the south side. The latter is the largest, and is called Penguin, or Burnt Island. The soundings to the space between these islands, decrease from 20 to 7 fathoms; and within the isles from 7 to 8 fathoms. Here, therefore, a convenient shelter may occasionally be found, and a day's sport, if desirable, among geese, bustards, ducks, seals, &c.

L'AIGLE SHOAL.—This shoal was seen on the 1st of October, 1817. Mr. Poole places it in latitude 51° 51′ S., and longitude 64° 50′ W. It extends about north and south, breaking very high in an extent of 200 or 300 yards. The ship was then steering S. E., and about three quarters of a mile from it, off and on. Steering south, about 1½ mile, had soundings in 87 fathoms.

L'AIGLE ROCK.—This rock is also reported by Captain Saloy, commander of the French brig-of-war L'Alert, who places it in lat. 51° 45′ S., long. 65° 10′ W., having soundings in a few feet water, rocky bottom. Also seen by several merchant vessels, one of which lowered a boat, and sounded on it. A depth of only a few feet water was found, and the surface of it, according to the lead, seemed to be very uneven. Captain Saloy also reports, that the sea always breaks on it. The position of this rock renders it exceedingly dangerous to vessels going round Cape Horn into the Pacific, as it lies nearly midway between the Falkland Islands and the South American Coast.

EAST AND WEST PATAGONIA, STRAITS OF MAGALHAENS, AND THE SEA COAST OF TIERRA DEL FUEGO.

[From the Survey of Capt. P. P. King, R. N., F. R. S., &c.]

COAST OF PATAGONIA, FROM PORT ST. ELENA TO CAPE VIRGINS.

[In the following directions, all the bearings, which are not otherwise distinguished, are corrected for variation. The latitudes being all south, and the longitudes west of Greenwich, and the variation easterly, the distinguishing letters, S., W., and E., have been omitted.]

PORT ST. ELENA.—The plan in the Admiralty Chart, which is a copy of the excellent and correct survey by the officers of the Spanish ships Atrevida and Descubierta, is sufficient for the navigator: there is also a plan in Weddel's Voyage, that is equally correct. The harbor may be easily known by some hummocky hills on the N. E. projecting point, on the eastern of which is a remarkable stone that appears to have been placed there as a monumental record, but which is a natural production. The best anchorage is at the N. W. corner of the bay, in 6 or 7 fathoms, but not too near to the shore, for when the sea is heavy, the ground swell breaks for some distance off. In working into the bay the 2 fathom bank must be avoided, for which the low island is a good mark.

The projecting head, at the north end of the bay, is in

Latitude ..... 44° 30′ 45″
Longitude, by the mean of 13 chronometers from Goritti, (River Plate,)... 65° 17′ 25″
Variation of the compass, ... 19° 10′
H. W. at full and change, ... 4 o'clock.
Rise at springs, ... 17 feet.

The water that is contained in the wells, the situations of which are given from Mr. Weddel's plan, is too brackish to be worth consideration; nor is there any fresh water to be obtained from any part of the harbor. Of fuel, a temporary supply may be procured from the small shrubby tree that is described in the account of Port Desire, which is tolerably abundant here. Guanacoes, ostriches, armadillos, and the cavia, or Patagonia hare, are to be procured, as are also wild ducks, partridges, snipes, and rails; but fish seem to be scarce. The guanaco affords an excellent food, but it is difficult to approach them: one that was shot by us, when cleaned and skinned, weighed 168 pounds. The Indians sometimes visit this part of the coast, which is used by them principally for burying their dead.

In approaching Port St. Elena from the northward, there are several rocks near the shore, which are very little above the water, and there is a considerable reef in the offing, situated 4¼ miles, S. 78° E., from Cape Raso, and N. 51° E., 8 miles from the N. E. trend of the north head of the port. It is a dry rock, and is near the extremity of a ridge, which probably projects off from the latter point, for there are two dry rocks in the same line of bearing, one 1½ mile, and the other 3⅓ miles from the point, besides several reefs for 2 or 3 miles off; great caution should therefore be used in approaching the coast, as the water is deep, and if becalmed, it may be necessary to anchor, which will be in at least 30 fathoms water.

Should the above reef be as continuous as it appears, there should be good riding in the bay, between Cape Raso and Port St. Elena.

Between the south head of Port St. Elena and Cape Two Bays, are two bights in the coast, the southernmost of which is considerable, and may probably afford a good anchorage. Cape Two Bays is a rounded point; the hill close to the sea, on the most projecting part of the cape, being in lat. 44° 58′: the small islet of Arce, to the south-east of the cape, is in lat. 45° 0′ 50″, and longitude 65° 25′ 25″; and Rasa Island is in lat. 45° 6′ 30″, lon. 65° 20′ 11″.

The coast trends westerly round Cape Two Bays, and forms the northern part of St. George's Gulf.

The southern limit of St. George's Gulf, Cape Three Points, is very easily discovered at sea, by its very level outline, being a long range of table land, higher than any part near it, visible from the deck for more than 20 miles; and to the south-east, detached, but near the range, there is a conical hill, which is easily discerned from the northward, but from the north-east is not seen, being concealed by the ranges of land behind it in the south-west. At 6½ miles to the south-east of Cape Three Points, is Cape Blanco, a low rugged tongue of land, terminated by a rounded but very rugged hillock, and two smaller ones; which, when first seen, appear to be islands detached from the coast. The neck of land which forms the communication with the coast, is low and sandy, and probably offers, on its south side, shelter from southerly winds.

There are several shoals off this part of the coast, that at low water would doubtless be dangerous. His Majesty's ship Adventure, passed over two, and had not less than 5 fathoms, but possibly at low water the depth may be considerably less; they are thrown up by the force of the tide, which sweeps round the cape, into and out of St. George's Gulf, with great strength.

The north and south ends of the northern shoal bear respectively from Cape Three Points and Cape Blanco, east, distant from the former 7 miles, and from the latter 5 miles; consequently, it extends in a N. by W. and S. by E. direction, for 5½ miles: it is scarcely a quarter of a mile wide.

The north end of the southern shoal bears S. 75° E., 7 miles from Cape Blanco, and extends in nearly a south direction for 2 miles. Between these shoals there is a passage 2 miles wide, and the depth gradually increases to more than 15 fathoms.

Within the outer shoals are two others, seen by the Spaniards; they are laid down from the authority of a chart communicated to me by Don Felipe Bauza. The outer northern shoal is probably the one noticed by Commodore Byron,* who described it to bear from Cape Blanco W. S. W. ½ S., 2 leagues, the depth diminishing, as he approached it from the eastward, from 13 to 7 fathoms. There is, however, much shoal ground to the north-east; for in the year 1829, having approached the land, and being 14 miles from Cape Three Points, bearing S. 38° W., magnetic, the depth rather suddenly decreased from 40 to 14 fathoms, pebbly bottom, so that the foul ground extends for 14 or 15 miles

* *Shoals off Cape Blanco.*—Mr. Simpson's Journal says, "Found various soundings, the shoalest water 7 fathoms, on a bank. Then Cape Blanco bore S. W. by W. ½ W., 2 leagues, and the southmost land in sight, south. This shoal shows itself by a great rippling; we had 12 fathoms without it, close to the rippling, and were soon over it, and steered directly in for the land. The water soon after deepened very fast; at one league from the shore we had 42 fathoms."

The shoals, therefore, that the Adventure passed, are the same as the above. Hawkesworth has doubtless made an erroneous extract from the Commodore's Journal, in describing them to be four instead of two leagues off the shore.

to the north-east of the cape, the edge of the bank, (14 fathoms,) being about 8 or 10 miles within the soundings of 50 fathoms. On approaching it, the quality of the bottom becomes irregular, and changes from ooze to sand, and the shoal patches are pebbly; so that by attention to the soundings and nature of the bottom, these shoals may be easily avoided.

A good mark to avoid them is, not to approach so near to the cape as to see the rugged hillock of Cape Blanco, and to keep the high land of Cape Three Points, which is visible from the deck, about 20 miles, on the horizon.

The flood, or northerly tide, ceased in the offing at 4 h. 15′ after the moon's passage, which agrees very well with the establishment of the tide off Penguin Island; but in the neighborhood of the cape, and among the shoals, the tides may be less regular; they produce strong ripplings, and set with considerable strength.

There is reason to think that the two capes* are laid down erroneously in latitude, and that the distance between them should be greater; for, by a latitude observed at sea, compared with good bearings of the two capes, the error of the chart would be seven miles too southerly. We had no good opportunity of investigating this point, and the situation assigned to them is taken from the chart communicated to me by Don Felipe Bauza, above referred to.

The coast line between Cape Blanco and Port Desire has been imperfectly seen; within the distance of 3 to 5 miles from the shore, however, there are several small patches of rock, which uncover at half tide, but beyond that belt the coast is free from any known danger, and may be approached by sounding in not less than 14 or 15 fathoms: within that limit the ground is foul. To the northward of Port Desire the land is low, with a shingle beach, excepting for the first 3 miles, where it is high and cliffy. The north point of the entrance of the bay is a steep bluff, which is remarkable in being the only point of that description along the coast to the northward. At 3 miles N. 28° E., magnetic, from this bluff, there is a ledge of rocks, (Surrell's Ledge,) a quarter of a mile without which the depth is 13 fathoms. The Tower Rock becomes visible after passing this ledge: it opens out when the north bluff bears S. 50° W., magnetic. A ship bound to Port Desire, or merely wishing to anchor in the bay which fronts it, may procure a good berth in 6¾ fathoms, at low water, well sheltered from N. ¾ W. to S. 50° E., magnetic, with the

North Bluff bearing.....N. 48° W. }
Tower Rock.....N. 82¼ W. } Magnetic.
Penguin Island.....S. 50½ W. }

This situation being a little to the southward of the fair way of the port, and about one mile and a half from the nearest shore, is quite out of the strength of the tide; the bottom, being strewed with rounded stones, is rather foul for hemp cables, but the holding ground, although of such suspicious quality, seemed to be good; at this place the tide rose from 6¾ to 9½ fathoms, a difference of 16½ feet.

PORT DESIRE.—The River of Port Desire has rather a difficult entrance, from the strength of the tide and its narrow width, and it is rendered still more confined from several rocky reefs that extend off the north shore to nearly mid-channel. There is good anchorage off the mouth. By waiting, therefore, for low water, all the dangers that exist will be seen, and the vessel easily dropt in with the tide, should the wind be, as it generally is, westerly. If it be fair, it is advisable for the ship to be in the entrance at slack water; or, if the breeze be strong enough, a little before; as the water is deep on the south shore, there seems to be no real danger that may not be avoided by a careful lookout for kelp, which always grows upon, and therefore plainly indicates the existence of rocky ground. The course in is about S. 76° W., magnetic, and the distance from the entrance to the anchorage is one mile and a half. The anchorage is off the ruins † on the north shore, and the vessel should be moored: the tide sets in and out regularly.

The river was examined for 16 miles, but is probably navigable to a much greater distance.‡ Four miles above the ruins there is a small peninsula, connected by a narrow

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* *Cape Blanco.*—The Spanish chart, from which I have laid down the cape, places it in latitude 47° 15′. Mr. Simpson's Journal describes it to be in latitude 47° 10′, which is only 2 miles short of what our observations made it.

† Some years since, a Spanish colony was founded at Port Desire, but not answering the purpose, it was soon afterwards given up. The ruins of the edifices, which are of stone, and the remains of a fruit garden, that at our visit produced quinces and cherries, distinctly point out the spot.

‡ *Port Desire.*—I have recommended the river to be entered at young flood, but Mr. Simpson thinks the last quarter flood to be the best time. If the latter be adopted, I would advise that the ship should be anchored off the entrance during the low water, in order to see the banks and rocks uncovered, since they will not be visible after half tide.

The Journal also mentions that the Commodore found a small run of good fresh water at about 2 miles S. W. of the Tower Rock. They filled five or six tuns of it. A pole was erected near it, to point the spot out to future visitors.

isthmus to the north shore; by sending a party up, and stationing men with guns on the isthmus, it is very likely that several guanacoes may be shot as they are driven across it; for the peninsula is their favorite place to feed upon. These animals are very abundant, but unless stratagem be used, they are very difficult, from their shyness, to be approached. There are some water holes near the ruins, which generally contain water, but of so brackish a quality as scarcely to be worth notice. The wood, although of very small size, burns well, and is much prized by sealers for that quality; it is a low shrubby tree, bearing a yellow flower, with a prickle at the extremity of every leaf. The sealers call it *piccolo*, from the small dimensions of the stem. The roots also are dug up and used for fuel.

The outer side of Penguin Island is bold, and may be passed very close without danger, for the tide rather sets off than towards the shore. The tide is very rapid, and forms, even in a calm, strong ripplings, which, in a breeze, must be very dangerous for boats to pass through, and, indeed, not agreeable for vessels of any size. The flood sets to the northward, and during its strength, at more than 3 knots; for we found the ebb to have set us 15 miles to the south in 5 hours. Off the island, the high water, or the termination of the northerly stream, takes place at about 4h., or 4h. 15m. after the moon's passage; which is 3½ or 4 hours at least after it is high water at the shore.

SEA BEAR BAY is one of the best anchorages that I know of on the coast, but is difficult of access, without a leading and a fresh wind, on account of the strength of the tides, which set to the northward through the narrow channels separating the rocky islets that are strewed between Penguin Island and the main land. The bottom, besides, is not only deep, 23 to 30 fathoms, but is very foul and rocky; and although a ship may be prevented from drifting through by dropping an anchor, yet its loss, from the foulness of the ground, would be almost certain. In entering the bay, border pretty close to the low rocky point to the southward, to avoid a reef that lies about a quarter of a mile without it; but as the sea always breaks upon it, the eye and a due consideration of the tide are the best guides. This reef extends for some distance to the eastward of the breakers, and therefore the tides, when within it, set in or out of the bay but with little strength. Should a ship not be able to enter the bay, there is anchorage off the point between it and the reef, on, I believe, tolerably clean ground. You will have 12 or 13 fathoms off the reef: then the depth shoals for one or two heaves to 7 fathoms, after which it deepens again: you may then haul across the bay, and anchor at about a quarter of a mile within the low rocky point, bearing E. ¼ N., or E. by N., by compass, in 4 fathoms, low water, avoiding the kelp which projects off from the low sandy beaches; this is, however, sufficiently distinct, and for further directions the plan will be the best guide. A small vessel may easily turn in, but I should hesitate taking such a step in one that I could not make quite certain of. When once in, the anchorage is good, and protected at all points, except between N. 41° and N. 78½° E.; but from the appearance of the beaches I do not think a heavy sea is ever thrown into it. There is no wood to be procured of any size, and the few gallons of water that are collected in the wells at the point so very precarious as to be scarcely worth attention. The passage to the watering holes is over a small rocky bar, which a boat may cross at three-quarters flood; it is immediately within the eastern point of the bay: there is a small spring at the north end of the third sandy beach, which a herd of guanacoes was observed to visit every morning, but as the water only trickles down in a very small quantity, it cannot afford more than a temporary supply. Two of the three wells at the point we found to be full of sea water, which had breached over the rocks; the other contained about forty gallons, of rather a brackish taste. Besides a good and secure anchorage, this place affords no other advantages: it is convenient for sealing vessels to anchor in whilst employed in their occupation upon Penguin Island.

Sea Bear Bay is in latitude 47° 56′ 49″, and longitude 65° 44′; variation 20°; high water at full and change 12h. 45m., and the tide rises 20 feet.

Spirings Bay is contained between the south head of Sea Bear Bay and the point within the Shag Rock; it forms a considerable bight, but is much exposed, being quite open to the south and east, and at the conclusion of the S. W. gale, when the wind always veers to south and south by east, there is a considerable sea. The shore is skirted for some distance off with many rocks, and the bay altogether is quite unfit for anchorage. The land is of the same height as about Sea Bear Bay, but has more lumps or nodules of rocky hills visible on the outline of its summit.

Off this bay, in the old chart, is laid down a rock called the Eddystone. It would seem that this rock, and the Bellaco Rock, discovered by Nodales, in 1619, is the same danger; but the whole coast between Cape Blanco and Port St. Julian is much strewed with shoals, which are the more dangerous from the strength of the tides which set between them. In navigating upon this part of the coast, the depth and quality of the soundings is a good guide, and, as a general rule, when the depth is more than 40 fathoms, there exists no *known* danger.

In directing the ship's course by night near this coast, regard should be paid to the tide, which sets with considerable strength, the current running parallel with the shore.

The Shag Rock is a whitish mass of rock, perfectly bare, lying about one mile and a half off shore: two miles to the south of it are four small dark colored rocks; and at 3 miles S. S. W. from it, there is rather a large rocky islet.

On the land, and at a short distance from the coast, are three hills, which appear, when a little to the southward of Sea Bear Bay, like three round topped hills, but on reaching more to the southward, they extend in length, and form into two hills, and at 3 leagues to the south of the Shag Rock, they appear to form one mass of table land. Watchman's Cape is very low, and may be distinguished by its bell-shaped mount: at 2 leagues from the point is a shoal with kelp upon it, on which the least water is 3 fathoms, but on approaching it the depth gradually decreases: there are also many other shoal patches, but are all buoyed with sea weed; the ship passed between several in 7 and 9 fathoms.

The ground is very foul and uneven for more than 4 miles from Watchman's Cape. Here the coast trends round to the westward, and becomes higher. Being to the southward of the cape, there appears a mount about 2 miles from its extreme point, resembling Monte Video, in the River Plate, both in shape and color, but not quite so high. It is called Monte Video, and in lat. 48° 18′ 55″, and long. 66° 18′.

The Bellaco Rock, or San Estevan's (Stephen's) Shoal, which was discovered by the Nodales, in 1619, was searched for in vain in the Descubierta and Atrevida's voyage; but Capt. Stokes, in the early part of 1828, on his passage down the coast, found it, and had an observation of the sun close to it for the latitude. It is in latitude 48° 30′ 50″, and long. 66° 9′ 25″. It bears S. 13° E., 10½ miles from the extremity of Watchman's Cape, and S. E., magnetic, from Monte Video. The rock is a dark mass, about 9 or 10 feet above the water at high tide, and has the appearance of a boat turned bottom up. Within half a mile of its south side the Beagle sounded in 12 and 15 fathoms, rocky bottom, and on its east side, at the same distance, the depth is from 20 to 24 fathoms. The ground around it being foul and uneven, the coast in its neighborhood should be avoided. Between Watchman's Cape and Port St. Julian the land is of moderate height.*

Wood's Mount is visible from the deck for at least 11 leagues, and is a good mark for Port St. Julian, being flat topped, and much more elevated than the land about it. The trend of the coast may also be a good mark; but as the land about Port St. Julian is higher than to the southward or northward, and Wood's Mount is so remarkable a feature, no mistake can be made. In a line with the south point of entrance the mount bears N. 86 ½ W. (W. 16° ½ S., magnetic.) The north head, Cape Curioso, is a low point jutting out to the northward, formed of cliffs horizontally stratified, of which the upper part is white brown, and the lower generally black, or with black streaks.

Keeping Wood's Mount bearing S. 67° W., by compass, will lead you to the south head, which will be easily distinguished when at the distance of 6 or 8 miles, or more, according to the state of the weather.

The land to the southward of Port St. Julian is uniform, flat, and low. It is covered by scrubby bushes, and fronted by a shingle beach. At 10 or 12 miles south of it, coming from the E. S. E., a small flat topped hill is seen over the low coast hills.

In lat. 49° 27′, the character of the coast changes entirely to a range of steep white clay cliffs, the average height of which was calculated, by angular measurement, to be about 300 or 330 feet. They rise like a wall from the sea, which, at high water, nearly washes their base; but at low water they are fronted by a considerable extent of beach, partly of shingle and partly of mud. Some short rocky ledges, which break at half tide, lie off certain parts of this range, but none of the ledges extend for more than a mile from the shore. This cliffy range occasionally forms projections, but so slight as not to be perceived when passing abreast of them.

Anchorages along the coast may be taken up, with the wind off shore, at from a mile to two miles from the beach, in from 9 to 12 and 14 fathoms, oozy bottom. In latitude 49° 55′ the range of steep white cliffs begins gradually to diminish in height, and terminates, at 9 miles farther to the southward, in a low point, forming the northern side of the entrance of Santa Cruz River. It is called in the chart North Point, and is in lat. 50° 5′ 20″, and 68° 3′.

SANTA CRUZ.—The appearance of the coast about the entrance of the River of Santa Cruz is very remarkable, and easy to be known, from the manner in which it makes when seen from the northward, and is even more conspicuous when seen from the southward. From the latter direction a coast line of cliffs and downs of considerable height is seen extending to the southward of the entrance as far as the eye can reach, and terminating abruptly to the northward in a high, steep, flat topped cliff, Mount Entrance, of which the upper part descends vertically; the lower slopes off, and appears

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* *Eddystone.*—Byron saw this rock, but from his position of it there seems to be little doubt that it is the Ballaco Rock of Nodales. Mr. Simpson's Journal says, "it is 5 leagues from the shore, and is covered at high water. It bears from Penguin Island S. S. W., a little westerly, distant 14 or 15 leagues, and is in lat. 48° 36′." (The latitude of the Bellaco is 48° 30′ 50″.)

to be united with some very low land, which will be seen extending (according to the distance off,) two or three points of the compass to the northward of it. Mount Entrance is at the south entrance of the river, and is, by angular measurement, 356 feet high. The low land is on the northern side of the entrance of the river.

The outer part of the bar, on which, at low tide, there are 14 feet water, is nearly four miles S. 63° ½ E. from Mount Entrance, and 9 miles from North Point, bearing N. 54° E.

Fourteen miles up the river, on the south bank, is Weddel's Bluff, a conspicuous headland; and 11 miles farther is another called Beagle Bluff. Beagle's Bluff, open of the south entrance, and in a line with the centre of Sea Lion Island, bearing N. W. by W. ½ W.,* by compass, is the leading mark for the passage over the bar. With this mark on, and at high water, the Beagle crossed the bar in 7½ fathoms.† The Beagle Bluff, a little open of the low points of the north side of the river, is also a leading mark to cross the bar.

After passing the bar, which is about a mile broad, there is no inpediment to a free course up the river, keeping midway between the narrow points of entrance, until reaching the shoals which project off the east point of Sea Lion Island. The best anchorage seems to be that occupied by the Beagle, on the south side of Sea Lion Island, where the water is shoaler and the tide not so strong.

At Weddel's Bluff the river divides into two arms. The northern one, which trends under the east fall of the Beagle Bluff, was examined by Captain Stokes, for 12 miles above its commencement, where it ceased to be navigable, even at high water. Its bed was divided by banks of sand into several little fordable streams, preserving, as far as the inequalities of the land would permit the eye to follow their course, a mean N. W. by N. direction. The stream at this part was quite fresh, but still subject to the regular ebb and flow. On the boat's return she was left dry for six hours, in the middle of the channel, about two miles above Beagle Bluff. At half tide the boats took in their water at this place.

The shore on the S. W. side is a range of clay cliffs, of the average height of 250 feet, with grassy downs, and intersected with valleys and ravines. On the eastern side, the land for the most part is low and level, with a shingle beach. The aspect of the country is dreary, the soil gravelly, and the vegetation scanty, the largest production of that nature being bushes bearing berries, none of which exceed 7 or 8 feet in height. Many brant, geese and ducks were seen, as well as the common sea fowl of these parts, such as penguins, cormorants, gulls, ducks, and divers. Several ostriches also made their appearance on the beach, and traces of guanacoes were observed.

The south-western arm, which is the most considerable one of the two, was examined for 33 miles. It was supposed by Weddel to be of such considerable size and interesting appearance as to be likely to communicate with some branch from the Strait of Magalhaens. The first reach of the arm runs S. W. by W., 6 miles, with a mean breadth of 2½ miles. At 1½ league up, the boat, being anchored for the night in mid-channel in 12 feet, was left dry at low water. At the place of the first observation, on the north side, in lat. 49° 57′, and long. 68° 53′, the influence of the tides had altogether ceased, and the water was quite fresh. The stream ran beautifully clear and pure, with the velocity of at least 5 miles an hour, over a bed of pebbles mixed with dark sand; its mean breadth being three-quarters of a mile, and depth in mid-channel 8 feet. It runs between two nearly parallel ranges of hills, about 4 miles asunder. Beyond this the reaches are short, seldom more than 2 miles long, forming tortuous courses between S. S. E. and W. by S. The winds blew directly down, and the rapidity of the stream was so great that the boat was obliged to be tracked up the river.‡

The examination terminated in lat. 50° 9′, long 69° 21′, which is 45 miles in a due west direction from its mouth, but by the course of the stream 53 miles.

At an anchorage outside the bar, Mount Entrance bearing N. 82° W., five miles off, and Weddel's Bluff N. 65° W., the Beagle rode out a gale from the S. S. W. and south, with a heavy sea, without driving. The soundings that are marked in the chart, outside the bar, were taken at low water, whilst the ship occupied the above anchorage.

The tides in the offing were observed to flow very regularly six hours each way, but to turn two hours later than the time of high water in shore. The flood, as before, was observed to run to the northward.

The coast to the south of the river is bounded by a ledge of rocks, which are either dry at half tide, or are then shown by a line of breakers; they extend as far off as three miles. On one occasion the Beagle anchored among them, and had some difficulty, and not a little risk, in escaping.

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* This is the bearing given by Weddel in his account of Santa Cruz.

† The rise of the tide is considerable. In going out, after crossing the bar, the Beagle anchored, and at low tide the water had fallen 26 feet.

‡ The above description of Santa Cruz and the river, is taken from the late commander Stokes' MS. Journal.

Between Coy Inlet and Santa Cruz the coast trends lightly in, and is formed by a succession of cliff and intervening low beaches. Coy Inlet is conspicuous, as it is the only part of the coast that has the appearance of an inlet between Santa Cruz and Cape Fairweather.

When within seven miles of its latitude, (50° 57′,) as well to the northward as to the southward of it, a ship should keep at the distance of four or five miles off the coast.—There can be no inducement to go nearer, as it affords neither fuel nor water; and if incautiously approached, much trouble and even danger may ensue, from the ledges of rocks which project at least three miles, and perhaps more, from the coast.

COY INLET.—There is no account either of Coy Inlet or of the Gallegos River in Captain Stoke's Journal; what is here given is taken from the chart, and from what oral information I have received.

Coy Inlet is a shoal salt water inlet, terminating at 19 miles from the entrance, and fronted by a bar of rocks, leaving a passage only of six feet water on their south side; inside there seems to be little more than 3 feet water, and in most parts of the inlet, the banks, which are of mud and sand, are dry at low water; it is useless for any other purpose than to afford shelter to a small boat. The southern side of the inlet is cliffy, and at its termination receives the drains of an extensive flat country.

Thence to Cape Fairweather the coast is similar to the northern part, but more free from rocky ledges, and good anchorage may be had from 2 to 6 miles off shore, in from 7 to 12 and 14 fathoms, muddy bottom; the water shoaling gradually to the shore. The beach is of shingle to high water mark, and then of hard clay as far as one hundred feet beyond the low water limit, where a green muddy bottom commences, and the water gradually deepens. The outer edge of the clay is bounded by a ledge of rocks, on which the sea breaks; it extends for some distance parallel with the coast.

The flood sets to the N. W. by N., and the ebb S. E. by S., 6 hours each way; high water, at full and change, between 9 and 10 o'clock, and the tide rises 24 feet.

In lat. 51° 16′, about 17 miles north of the cape, there is a ravine containing abundance of fresh water, which may be obtained, when the wind is off shore, without any difficulty; it is standing water, and being much grown over with plants, may not keep, but for a temporary supply it seemed to be very good.

CAPE FAIRWEATHER, is the south extremity of the long range of clay cliffs that extends from Coy Inlet, almost, without a break. The cape resembles very much Cape St. Vincent, on the coast of Spain; it also bears a very great resemblance to Cape Virgins, for which it has frequently been taken, notwithstanding there is more than 45 miles difference in the latitude of the two headlands. This mistake was made in the Adventure as well as in the Beagle on our first visit, when, no observation for the latitude having been obtained, we were two days at anchor off it before our error was discovered. A similar error was also made by one of the ships belonging to the fleet under the command of Loyasa, in the year 1525, (see Burney's Collection of Voyages, vol. i. p. 131:) and the Nodales, in their description of the coast, warn the navigator from mistaking the one for the other, "y venido de mar en fuera a buscar la tierra, facilmente podian hacer de Rio de Gallegos el Cabo de las Virgines;" (and in making the land, Cape Virgins may easily be mistaken for the River Gallegos.) Voyage of the Nodales, p. 53.

On the old charts of this part of the coast, the shore is described to be formed of chalk hills, "like the coast of Kent:" the resemblance certainly is very great, but instead of chalk they are of clay. They are from 3 to 4 hundred feet high, and are horizontally stratified, the strata running for many miles, without interruption.

The interior is formed by open plains of undulating country, covered with grass and plants, among which is abundance of wild thyme, but entirely destitute of trees: it abounds with guanacoes, which may be procured by laying in wait at the water holes.

Besides the pond above mentioned, there is no want for fresh water; it may be seen trickling down the face of the cliffs, at short intervals.

The entrance of the River Gallegos is formed on the north side by the cliffy land of Cape Fairweather, and on the south by a low shore that is not visible at sea for more than 4 or 5 leagues, excepting the hills in the interior, called the Friars, the Convents, and North Hill. It is fronted by extensive sand banks, most of which may be crossed at high water, but at half ebb they are almost dry. The entrance is round the south extremity of the shoals, which bear from the south trend of the cape, S. 43½° E., distant 10 miles. The passage in is parallel with the coast to the southward of the entrance, taking care not to open the land to the northward of Cape Fairweather's most eastern trend, which, when in the fair way, should bear N. 40° W., magnetic. The shore on the larboard hand must then be gradually approached, and, in the present state of the knowledge we possess, the ship should be anchored to await low water, in 10 fathoms, at a mile and a half from the shore, so soon as the south point begins to be observed to trend round to the westward; the anchorage there is good, and well sheltered from the prevailing winds.

By anchoring, the passage in will be easily detected, and may be passed before the

shoals are again covered, which will be a good guide; 4 fathoms is the depth at low water in the narrowest part of the channel. Anchorage may be taken up on the south side, for to the northward the banks are extensive.

There is also a middle, and as it appears to be the widest, may be the best channel, for crossing the bar. The outer part was not completely examined; but no doubt there is a sufficient depth of water at three quarters flood for any vessel to pass it. The southern channel, however, is preferable, from having the land as a guide.

The river runs in to the westward for 30 miles, and then winds more southerly between two ranges of hills. Its banks are formed of downs, abounding with guanacoes and ostriches. The water is fresh at 25 miles from the mouth. In the entrance, the time of high water, at full and change, is 8h. 50m.; the rise of tide, at the springs, is 46 feet, and the stream runs as much as five miles an hour.

From the south entrance of the Gallegos River, the coast, towards Cape Virgins, extends in a more easterly direction than it does to the northward of Cape Fairweather; and, for the first half of the distance, is formed by a low shelving coast, that at a few leagues from the shore is not visible, so that a stranger might readily suppose it to be the entrance of the Straits of Magalhaens. There are, however, some marks by which it may be known, even should the latitude not have been ascertained. In clear weather, the Friars, and the other hills near them, would be visible; and in thick weather, the soundings off the cape will be an infallible guide; for at the distance of four miles off no more than 4 fathoms will be found, whereas, at that distance from Cape Virgins, the depth is considerable; the bottom also, to the north of Cape Fairweather, is of mud, whilst that to the north of Cape Virgins is of gravel or coarse sand; and the latter cape has a long low point of shingle running off it for nearly five miles to the S. W.; and, lastly, if the weather be clear, the distant land of Tierra del Fuego will be visible to the S. W.

At eighteen miles to the southward of Cape Fairweather, the cliffs again commence, and continue to Cape Virgins, with only one or two breaks; in one of which, eight miles north of the latter cape, I think a boat may land, if necessary. There is good anchorage along the whole coast, between the Gallegos and Cape Virgins, at from two to five miles off shore; but the bottom is rather stony, and might injure hempen cables. As the cape is approached, the ground becomes more foul.

Of the Winds and Weather, Tides and Variation of the Compass, between CAPE BLANCO *and* CAPE VIRGINS.

Our experience of the wind and weather upon this part of the coast was not sufficient to enable us to form any judgment of the changes that are liable to occur. The prevailing winds, particularly towards the southern portion, are from the south-west, from which quarter the gales are the strongest; but near the land, during the summer season, they veer about between south and W. N. W., and in the winter, when the sun has northern declination, they hang more commonly to the northward of west. Northerly winds are accompanied by misty or foggy weather, particularly on that portion of the coast between the Rio de la Plata and Port St. Elena.

The marine barometer here is of signal advantage. It is low with a northerly wind, but as soon as the column has fallen to 29 inches or lower, and ceases to fall, a change of wind from the S. W. may be expected; which commences with, or very soon follows, the ascent of the mercury: the wind then freshens and blows hard, and the weather clears up. The clouds are white, of large size, and of rounded form, and the air becomes elastic, dry and cold. During the existence of, and for some days preceding, a northerly wind, there is generally a very copious deposition of dew; indeed, the appearance of it is an infallible presage of the change. With northerly winds, the air is mild and excessively damp, but when they blow from the opposite quarter it is cold and dry. The wind rarely blows from east, but sometimes obliquely towards the coast from N. E. or S. S. E.

The *flood tide* sets to the northward parallel with the coast. Near Cape Virgins, the northerly tide ceases at about four hours before the moon's passage: in the Gallegos River it is high water, at full and change, at 8h. 50m., and rises 46 feet; at Cape Fairweather, at 9 o'clock, and rises 28 feet; at Coy Inlet, at between nine and ten o'clock; at Santa Cruz, about 10h. 15m., rising 38 feet, but in the offing two hours later; at Sea Bear Bay, 12h. 45m., rising 20 feet; Port Desire, 12h. 10m., rise 18½ feet; and at Port St. Elena, at 4 o'clock in the afternoon, they rise 17 feet. In the offing of Port Desire, the tides are 3½ or 4 hours later than they are in shore, which is probably owing to the eddy tide setting out of St. George's Gulf.

The *variation of the compass* gradually increases from the Rio de la Plata, where it is about 14°; in lat. 36°½, long. 55¼°, it is about 14°½; in lat. 41°, and long. 60°, it is 16°; in lat. 41°⅔, and lon. 60°¾, it is 17°; at Port St. Elena, 19° 10′; at Port Desire, 19° 42′; at Sea Bear Bay, 20° 47′; at Port St. Julian, 22° 18′; at Santa Cruz, 20° 54′; at the River Gallegos, 21° 47′; and at Cape Virgins, it may be considered about 22°½. At the

last place, according to Sir John Narborough,* the variation in the year 1670, was 17°, and Wallis and Carteret,† in the year 1767, found it 24° 30′; so that it has scarcely altered within the last hundred and sixty years.

Strait of Magalhaens—Cape Virgins to Fort Famine.

CAPE VIRGINS, a steep cliff, about 300 feet high, (in lat. 52° 18′ 35″, and lon. 68° 16′ 55″‡) is the southern extremity of the Patagonian coast, and the north entrance of the Strait of Magalhaens. There is an appearance of a reef that may extend off the point for half a mile, but not beyond that distance. The Adventure passed at 1½ mile from it, sounding in 8 fathoms, stones; and then standing to the south, crossed a bank of gravel, sounding regularly in 7 fathoms, until Dungeness Point bore S. W. by W., by compass, when the water deepened. This bank trends off more to the southward and eastward, but I believe its termination is at 5 miles, S. 87° E., from the extremity of Dungeness.

I do not imagine that any part of it is shoal enough to endanger a ship, but near its extremity there are some overfalls, among which, the least depth that we found was 5 fathoms, at low water.§

In rounding Cape Virgins, unless the wind be easterly or southerly, I should recommend a ship to pass within one mile and a half of the cape, and steer S. by E., by compass, until Dungeness bears S. W., mag.; then to edge away around the latter point, and afterwards the coast is clear to Cape Possession. In moderate weather ships may anchor any where between Dungeness and Cape Possession. The bottom is of good holding ground, and quite clean. At from 3 to 5 miles from the coast, the depth will be from 15 to 20 fathoms.

We knew nothing of the Fuegian shore, or south side of the entrance. The Beagle, in beating in, made a board for 8 miles to the southward of Dungeness, and had 40 fathoms; but I believe the coast to be of shoal approach, and to be lined by a bank that is connected to the extensive reefs which project from Cape Orange.

CAPE POSSESSION is a cliffy headland on the north shore, and will be seen opening round Dungeness, on the magnetic bearing of S. 86° 30′ W.; the distance between them is 20 miles; at 10 or 12 miles to the west of Dungeness, Mount Aymond will make its appearance, bearing N. 85° W., magnetic.

POSSESSION BAY, which extends from Cape Possession to the entrance of the First Narrow, curves in to the northward round to the cape, and is fronted by an extensive shoal, stretching off for more than 4 miles from the shore, many parts of which are dry at half tide: on its south side the depth diminishes gradually, and offers good anchorage for vessels entering the strait, to await the tide for passing the First Narrow.

On the western side of the bay, there are some remarkable hills of a darker green hue than others near them; I have called them the Direction Hills; because, after passing Cape Possession, they afford a good mark for approaching the Narrows, which are not visible until well across the bay; by attention also to their bearings, the shoal that extends off Cape Orange may be avoided. To take up an achorage on the bank, great attention must be paid to the soundings, which at the edge decrease suddenly; it would not be advisable to anchor in less than 10 or 12 fathoms, at high water, for the tide falls 6 or 7 fathoms; but as the stream runs much weaker on approaching the edge of the bank, the nearer to it the better. A good berth for anchoring is to get the northern Direction Hill, (which is dark colored and very conspicuous,) to bear S. 56° W.; Mount Aymond, N. 45° to 50° W.; and the highest (easternmost) peaked hillock upon Cape Orange, about S. S. E., (compass bearings.) When the hill above noticed bears S. 56° W., and Mount Aymond between N. 50° and 60° W.,‖ you are in 19 or 20 fathoms, just off the edge of the bank; about half to one mile more to the northward, or northwestward, good anchorage may be selected, out of the strength of the tide.

There is, however, a more advanced situation about half a mile to the eastward of the end of the shoal, that may easily be taken up; namely, that where 14 fathoms is marked on the plan, for which the following are the bearings:—The

Northern Direction Hill,	S. 59° W.	Mag.
Mount Aymond,	N. 43° W.	
Peak of Cape Orange,	S. 22° E.	

* Narborough's Voyage, p. 60. † Hawkesworth, vol. i., p. 410.

‡ By chronometrical observation, 68° 17′ 46″.

§ The shoal soundings of 5 fathoms off Cape Virgins, bear from the cape, S. 35° E. There is anchorage under Dungeness, with westerly winds. Wallis anchored in 10 fathoms, gravel; Cape Virgins bearing N. by W. ½ W., and Dungeness S. by W.; but these bearings, when laid down in the chart, do not appear to be correct. The Dolphin anchored at 4 miles off the cape, bearing N. ½ E., and at 2 or 3 miles from the extremity of the Ness, bearing S. S. W. ½ W.

‖ These bearings are by compass. The variation of the needle is 22½°.

One mile more in advance, to the S. W., would still be a better berth, but great care must be taken not to ground on the tail of the shoal. At about half a mile or more to the eastward, the situation would be more secure.

Should the distant land behind Cape Gregory be seen, which makes with a long blue level strip of land, terminating at its S. W. end with rather a bluff or precipitous fall, it is a good mark for the above anchorage. The fall, or extremity, should be visible in the space between the southernmost and central of the Direction Hills. There is also a conspicuous lump on the same land, which will be seen a little to the eastward of the northern Direction Hill; and the Asses Ears, nearly out of sight, should be seen a little to the eastward of that part of the shore of Possession Bay where the cliffy coast commences.

Another mark for the approach of the bank, which is very good when Mount Aymond bears more westerly than N. 43° W., mag., is, not to lose sight of the Asses Ears. At our anchorage, in 6 fathoms, near the dry part of the bank, they were lost sight of by a rise in the land; half a mile to the southward, at the anchorage marked 11 fathoms, one of them re-appeared above the land; Mount Aymond at the same time bearing, by compass, N. 41° W., mag. But this rule fails to the westward, or nearer the Narrow, for the bank then trends more southerly, and the Asses Ears are visible at its edge; the west limit of this rule is, as before noticed, when Mount Aymond bears about N. 43° W., mag. There is, also, another remark worth attending to; which is, that, after passing Cape Possession, Mount Aymond assumes the appearance of a round obtusely-peaked hill, with a smaller elevation on each edge of its outline; which appearance is preserved until it bears N. 50° W., mag., and then the easternmost of the minor elevations gradually disappears, while the western one becomes more conspicuous.

To avoid the north shoals, do not get the North Direction Hill to bear more southerly than S. 56° W. mag.; and the mark for avoiding the reefs that extend off Cape Orange, is not to get the same Direction Hill to bear more westerly than W. by S. ¼ S., mag., (for W. by S. ½ S. will just pass without the edge,) until Mount Aymond bears N. 48° W., mag., or the peak of Cape Orange south, mag., when the fair way of the First Narrow will be open, bearing S. W. by S., mag. The north, or north-western side of the First Narrow, is a cliff of moderate height, and makes like a flat table land. When abreast of Cape Orange, a S. S. W. mag. course must be steered. The tide sets right through; so that in drifting, which with the wind against the tide is the safest and best plan, there is no danger of being thrown upon the shoals.*

The First Narrow was called by Sarmiento, Angostura de Nuestra Senora de Esperanza. He describes it very correctly to be 3 leagues long, and less than half a league wide, with cliffy shores; the tide running strong; the depth more than 50 fathoms, sand and pebbles (callao;) and on the north shore there is a beach of shingle. In this part, however, as discretion must be the best guide, it will be necessary merely to state the dangers that exist. To the north of Point Delgada, (meaning thin or slender,) the shore is fronted by extensive shoals that dry at half tide, and which, being dry when Sarmiento passed, was called by him Point Anegada (drowned land;) these should not be approached. The south shore, also, for nearly 5 miles to the west of Cape Orange, has a shoal off it, but it does not extend to a great distance from the beach; beyond this it is not safe to approach either shore within half a mile, for each is fronted by a bank that dries at low water. The western end of the Narrow, on the north shore, Sarmiento's Point Barranca, (meaning a cliff,) has a considerable reef off it, upon which there is a very large quantity of kelp. Point Barranca bears from Cape Gregory N. 48½° E., and is 19 miles distant.

After emerging from the Narrow, the ship should be allowed to drift with the tide, the course of which is S. S. W., for at least 3 miles, before hauling up for Cape Gregory, in order to avoid the ripplings, which rage furiously on each edge of the bank. I have passed twice through them for the sake of proving the depth, and once anchored within them, which gave me an opportunity of ascertaining the rise and fall of the tide; but it only altered 12 feet: the stream or current, however, set at 3 and 4 knots the whole tide, and there was scarcely five minutes slack water. It is an anchorage that ought not to be taken up without the greatest necessity, for the ripplings break over the deck, and the security of the vessel is very doubtful.

POINT BARRANCA is a flat topped sand hill, the position of which being given in the chart, its bearing will indicate the situation of the ship; the point on the opposite side Sarmiento called Point Baxa (low.)

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* *Reef off Cape Orange.*—This reef extends off to the E. N. E. for a considerable distance.—Byron struck upon it, as did also the Santa Casilda. The Adeona, a sealing vessel, in 1828, also struck upon it and was left dry; and the Beagle, in going to her assistance, crossed the tail of it at high water, occasionally striking the ground. Bougainville describes its position thus: "When the hillocks which I have named Quatre fils Aymond," (Asses Ears,) "only offer two to sight in form of a gate, you are opposite the said rocks."

After reaching thus far, steer W. S. W., by compass, until abreast of some remarkable peaked hillocks on the north shore; where, if necessary, anchorage may be had out of the tide, in from 6 to 10 fathoms; at any part of the northern side of the bay the anchorage is good, upon a clay bottom covered with broken shells: the lead brings up nothing but shells; underneath, however, it is of clay, and good holding ground.

It is best to anchor near the shore on account of the tide, which ripples very much all over the centre of the bay.

The peaked hillock above mentioned is certainly Sarmiento's Point Nuestra Senora del Valle; to the eastward of it is St. Jago Bay; and to the westward his Bay of the Eleven Thousand Virgins. When abreast of the point, the land and bay to the north of Cape Gregory will be easily distinguished; the former will be seen first, and resembles an island, for the land of the bay is flat and low; but a very conspicuous hummock will also be seen half way between it and the flat table land, as soon as the land of the cape becomes visible. The hummock is marked on the chart.

The extremity of Cape Gregory bears from the western end of the First Narrow, S. 73° W., (S. 50°½ W., magnetic,) distant 22 miles. The anchorage is from two to two miles and a half to the N. N. E. of the cape, abreast of the north end of the sand hills that form the headland, and about one mile from the shore, in from 13 to 15 fathoms. The bottom is excellent, a soft, but tenacious mud, which, nearer the shore, is of a stiffer quality. At low water a sand spit extends off for one-third or nearly half a mile from the shore, close to which there are 7 fathoms water. Care should be taken not to approach too near.

At the anchorage the tide turns to the south-westward, towards the cape, for two and a half or three hours before it begins to run to the westward in the Second Narrow; which should be attended to, for a ship will lose much ground by weighing before an hour or more after the tide has turned.

Upon the summit of the land of the cape, four-fifths of a mile to the northward of the extreme point, is a remarkable bush; close to which the observations were made. The bush is in lat. 52° 38′ 3″ S., and long. 70° 9′ 51″ W. The variation of the compass 23° 34′ E.

The country abounds with guanacoes and ostriches, and the valley, two miles to the westward of the cape, is frequently the abode of the Patagonian Indians; but their principal residence is upon the low land at the back of Peckett's Harbor and Quoin Hill, where guanacoes are more abundant, and the country more open. Ships coming from the southward also are seen by them at a great distance, so that by the time she reaches Cape Gregory they have already arrived to meet her. They do not, however, see ships coming from the eastward so easily, and we were, on two occasions, two or three days at the anchorage before it was known that we were present.

They are very friendly, and will supply guanaco meat at a small price. They are fond of beads and ornaments, but particularly of knives, and the larger they are the better. Swords are held in high estimation by them, as well as lead, for the purpose of arming their *bolas*, an instrument used to entangle the legs of the guanacoes and ostriches.

They also barter their mantles and skins; and are fond of sugar, flour, matte, (the Paraguay tea,) tobacco, and horse gear, particularly bits. For spirits they are very eager, but are contented with it in a diluted state. At our last interview they asked for muskets, powder, and ball, the use of which they have learned from two Portuguese seamen, who left an English sailing vessel to reside with them; but these were not given, and it is to be hoped that such weapons will not be put into their hands.

THE SECOND NARROW is about 10 miles long; and with a favorable tide, which runs five or six knots, is very quickly passed. With an adverse wind a ship will easily reach an anchorage to the north of Elizabeth Island.

The north side of the Second Narrow is very shoal, and ought not to be approached, for the ground is also very foul. There are two or three very inviting bights for a ship that is caught with the tide, but it is not advisable to anchor in them; she should rather return to the anchorage off Cape Gregory.

SUSANNAH COVE is where Sarmiento anchored in 8 fathoms, low water, half a league from the land, good bottom; but as it was exposed to the strength of the tide, he shifted to another anchorage about half a league west of Cape Gregory, where the anchor was dropped in 8 fathoms, but the vessel tailing on the edge of the shoal in 3 fathoms, he was glad to make his escape.

The south shore of the Second Narrow, which Narborough called the Sweepstakes Foreland, is composed of cliffs, and is, I believe, of bold approach. The projecting head in the centre is Sarmiento's St. Simon's Head, and the western end he named Cape St. Vincent, from its resemblance to that of Spain. To the southward of the eastern point of this head, Point St. Isidro, which is a low sandy point, is Fish Cove, where Bulkley and Cummings anchored their boat; and Sarmiento says, "We anchored behind a point before noticed, called Santisidro, in a small bay, of low land and sandy beach, in 10 fathoms, at a quarter of a league from the shore, but upon veering cable the vessel

was in 7 fathoms; so that fearing she would be left dry, from the great rise and fall of the tides hereabout, we shifted farther out to 15 fathoms, but the anchor dragged, and we subsequently came to in 9 fathoms, sandy bottom, where, at low water, the depth was 6 fathoms."*

Three miles to the westward of Cape Gracia, the western end of the Second Narrow, on the north side, is Oazy Harbor, so called by Narborough; it is a secure place for small vessels. The entrance is nearly two miles long, and too narrow for large ships, unless the weather be moderate, when they might drop in or out with the tide: the depth inside is from 3 to 10 fathoms. There is neither wood nor water to be got, and therefore no inducement to enter it: a plan of it was made. It is described by Sir J. Narborough,† and Cordova calls it Bird Bay (Ensenada de los Paraxos.‡)

NARBOROUGH'S PECKETT'S HARBOR, or, as Sarmiento calls it, St. Bartholomew's Bay, is 8 miles to the west of Cape Gracia, and, although very shoal, offers a good shelter, if required, for small vessels; but the space is very confined; the anchorage without is almost as safe, and much more convenient. The distance between the two points of entrance is nearly two miles, but from the north-east shore to the small island of the south-west point, the whole space is a shoal, upon the greater part of which the sea breaks in a moderate breeze.

The entrance is between the south-west point and the island, and is rather more than one-fifth of a mile wide. Half a mile outside the anchorage is good, in 7 fathoms: shoal ground extends for a quarter of a mile off the point.

The bay, which is formed by Peckett's Harbor and Elizabeth Island, is extensive and well sheltered, with an easy depth of water all over, between 5 and 7 fathoms; the nature of the bottom is clay, and offers excellent holding ground. In the centre is a patch of kelp; but it is not known whether the depth is shoaler in that part, or whether it proceeds from the bottom being rocky.

The tide is not strong to the westward of the north end of Elizabeth Island,§ but runs with considerable velocity in the deep channel between it and the Second Narrow. To the southward of the island the stream divides into two directions, and very soon loses its strength; one sets down the south side of the island, and the other between the islands of Santa Martha and Magdalena. This is the flood; the ebb sets to the northward. The ebb and flow are regular, high water, at the full and change, being at about 12 o'clock.

There is good anchorage, out of the strength of tide, at a mile to the north of Point San Silvestre; it is convenient for a ship to leave with the intention of passing round Elizabeth Island. I conceive this to be the most difficult part of the entrance of the Strait of Magalhaens, for the tide sets across the passage with some strength.

The passage to the west of the island is clear, and without danger, by keeping in the middle of the channel; but in passing down the south side of Elizabeth Island, the shore should be kept close to, to avoid being thrown upon the Islands of Santa Martha and Magdalena,‖ although I believe there is plenty of water between them, for Sarmiento anchored there in 15 fathoms; as well as to clear the shoal that extends off the south-west end of the latter island, upon which we did not find less water than 5 fathoms upon any part;¶ but the ground being irregular, and much kelp strewed about it, it is not safe to trust too much to appearances. On all occasions it is advisable to avoid passing through kelp; for although it frequently shoots up from 10, and even 20 fathoms, yet wherever the bottom is rocky, there it is to be found. The presence of this vegetable renders the few dangers that exist in the navigation of the strait of little consequence, for it serves as a buoy to mark the existence of them, and it is only by a careless lookout that a ship can be placed in a dangerous situation. Another advantage in kelp is, that by its drift it shows both the direction and velocity of the tide.

LAREDO BAY offers good anchorage in the centre and towards the north side, and particularly in the N. W. corner. Off the south point is a large patch of kelp, among which the ground is shoal and foul.

At Laredo Bay wood may be procured, and there is a fresh water lake of a mile in diameter at about half a mile behind the beach, much frequented by wild ducks.

For the purpose of anchorage only, the bay need not be entered; because a very good and secure berth may be found at from 1 to 2 miles off it, in 10 to 13 fathoms, having the S. W. extremity of Elizabeth Island on with, or a little open of, the trend of Cape Negro, which is Byron's Porpesse Point.

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* Sarmiento, p. 267. † Narborough, p. 62 and 124. ‡ Ultimo Viage, p. 107.

§ Elizabeth Island was so named by Sir Francis Drake. Sarmiento passed its north-east end, and, considering it a part of the continent, called it Point San Silvestre.—[Sarmiento, p. 255.]

‖ The Islands of Santa Martha and Magdalena, so named by Sarmiento, (p. 254,) have since been called by other names; the former St. Bartholomew, the latter St. George's, also Penguin Island.—[See Narborough's Voyage, p. 62.]

¶ Shoal off Santa Magdalena. Simpson's Journal says there are 3 fathoms on it in many places; the least water found by us was 5 fathoms.

We know scarcely any thing of the south side of St. Philip's Bay, or of the coast between Cape St. Vincent and Cape Monmouth. The latter is a lee shore, and should not be approached when the wind is northerly, for there seems to be no harbor or shelter, and the anchorage must be much exposed.

Two deep inlets were seen behind Sweepstakes' Foreland, from the summit of the table land near Cape Gregory, one of which may probably insulate it, but this was not ascertained.

Between Cape Negro and Sandy Point, which is Sarmiento's Catalina Bay, good anchorage may be had, from one to two miles and a half from the shore. Here the country begins to be thickly wooded, and to assume a very picturesque appearance, particularly in the vicinity of Sandy Point.

SANDY POINT, Sarmiento's Cape de San Antonio de Padua, projects for more than a mile from the line of coast, and should not be passed within a mile. A shoal projects off it in an east direction, (magnetic.) The mark for its south edge is a single tree on a remarkable clear part of the country, (a park-like meadow,) near the shore, on the south side of the point, in a line with a deep ravine in the mountain behind. One mile and a half from the point we had no bottom with 18 fathoms.

To the southward of Sandy Point, as far as Point St. Mary, good anchorage may be had at three-quarters of a mile from the shore, in 11 and 12 fathoms, sand and shells, over clay. At the edge of the kelp, which fronts the shore, there are 5 and 6 fathoms; so that, with the wind off shore, a ship may anchor or sail along it very close to the coast, by keeping outside the kelp. The squalls off the land are very strong, sometimes so much so as to lay a ship on her broadside. It is not prudent, therefore, to carry much sail in coasting this part; and it is necessary to have the quarter boats secured with gripes, because the wind, for a moment, blows with the force of a hurricane. These land squalls are denominated by the sealers "williwaws."

POINT ST. MARY, in lat. 53° 21′ 40″, is 12½ miles to the south of Sandy Point, and may be known by the land trending in to the southward of it, forming Fresh Water Bay. It has also a high bank close to the beach, with two patches bare of trees, excepting a few dead stumps. All the points to the northward are low and thickly wooded. As the bay opens, the bluff points at its south end become visible. There is also a remarkable round hill a short distance behind the centre of the bay, and a valley to the south of it, through which a river flows and falls into the bay.

It is convenient for wooding at, but from the river being blocked up by much drift timber, watering is difficult. The proximity, however, of Port Famine renders this of no material consequence.

When the wind is from the northward, a swell is thrown into the bay; but no danger need be apprehended from its being open to the eastward, for the wind seldom blows from that quarter, excepting in the winter, and then rarely with great strength. If it does, the holding ground is good, and with good gear there is no danger.

In standing into the bay from the northward, keep within three-quarters to half a mile from the coast, in 10 or 11 fathoms; and passing Point St. Mary, steer on towards the bluff points at the south end of the bay, until the south pitch of the Centre Mount bears W. S. W., when you will be clear of the kelp that extends off the north side of the bay, among which I believe there is a sufficiency of water, but the ground is foul. Round its edge there are 6 and 7 fathoms. Having the mount bearing as above, steer for it, or a little to the south of it, and anchor in 9 fathoms, sandy mud over clay, which will be with the following bearings:

Point St. Mary	N. 15° W.	Mag.
Outer Trend	N. 9° W.	
Centre Mount (south pitch)	S. 74°½ W.	
Entrance of River	S. 35° W.	
South Bluff	S. 21° E.	

A good berth may be had much nearer the shore in 6 fathoms, towards which the depth gradually decreases. If the anchorage is used merely as a stopping place, the first is best, for the wind near the shore is apt to flow and veer about.

Between Freshwater Bay and Point Santa Anna, the coast is very bold, and so steep as to offer no anchorage, excepting in the bay that is formed by the reef off Rocky Point; but it is small and inconvenient to weigh from, should the wind be southerly.

Should the day be advanced, it is better to anchor in Freshwater Bay than run the risk of being under way all night, unless it be in the summer, with moon-light and the weather likely to be fine. In this climate, however, the latter is very doubtful, for weather changes so suddenly that no dependence can be placed upon appearances.

POINT SANTA ANNA will appear, on standing down near the coast, to be the termination of the land; it is a long point extending into the sea, having at the extremity a clump of trees. It bears from Cape Valentyn S. 47½° W., mag. On approaching it,

the distant point of Cape St. Isidro will be seen beyond it; but there can be no doubt or mistake in recognizing it.

Along the whole extent of the coast, between the Point Santa Anna and Elizabeth Island, the flood sets to the southward and the ebb to the northward, and it is high water about 12 o'clock at full and change. The variation is about 23° west. The strength of the tide is not great, but frequently after a southerly wind there is, in the offing, a current to the northward, independent of the tide. In winter the tides occasionally rise very high, and on one occasion, in the month of June, nearly overflowed the whole of the low land on the west side.

PORT FAMINE.—Standing into Port Famine, pass round Point Santa Anna, if with a leading wind, at one-fifth of a mile, in 17 fathoms; but if the wind is scanty, do not get too near, on account of the eddy tide, which sometimes sets towards the point. Steer in for the bottom of the bay, for the summit of Mount St. Philip, keeping it over the centre of the depth of the bay; that is, half way between the rivulet, (which will be easily distinguished by a small break in the trees,) and the N. W. end of the clear bank on the west side of the bay. This bank being clear of trees, and covered with grass, is very conspicuous. Keep on this course until the mouth of Sedger River is open, and upon shutting in the points of its entrance, shorten sail and anchor in 9, 8, or 7 fathoms, as convenient. The best berth, in the summer, is to anchor over towards the west side, in 9 fathoms, with Cape Valentyn in a line with Point Santa Anna; but in the winter season, with N. E. winds, the best berth is more in the centre of the bay.

The strongest winds are from the south-west. It blows also hard sometimes from south, and occasionally a fresh gale out of the valley, to the south of Mount St. Philip. Unless a long stay be meditated, it would be sufficient to moor with a kedge to the N. E. The ground is excellent all over the port, being a stiff tenacious clay. Landing may be almost always effected, excepting in easterly gales, on one side or the other. There is fire-wood in abundance on the beaches, and wells, containing excellent fresh water, were dug by us at the N. W. extremity of the clear part of Point Santa Anna, on the bank above the third or westernmost small shingle bay. The water of the river, as well as of the ponds, of which there are many upon the flat shore of the western side of the port, is very good for present use, but will not keep, in consequence of its flowing through an immense mass of decomposed vegetable matter; but the water of the wells drains through the ground, and not only keeps well, but is remarkably clear and well tasted. Their situation is marked on the plan, and for some time our traces will not fail to show the road.

Our observatory, the situation of which is indicated by the stem of a tree 16 inches in diameter, placed upright, about 8 feet under and 3 above the ground, banked up by a mound, is in lat. 53° 38′ 12″, and 70° 54′. High water at full and change at 12 o'clock; the ebb sets to the northward, and the flood to the southward; but the rise and fall is very irregular, depending entirely upon the prevalence of the winds, northerly and easterly winds causing high tides, and westerly and south-westerly low tides. The variation is about 23° 30′.

Of the tides in Possession Bay and the First Narrow, we have had too little experience to enable us to give a very clear account; I shall, therefore, here confine myself merely to such observations as may be of service to the navigator.

To the south-east of Cape Possession it is high water at 4h. 56m. before the moon's passage; but the stream of tide continues to run in until two hours after the water has ceased to rise. The easterly tide commences at 2h. 56m. before the culmination.

The same is the case as far as, and even in, the First Narrow, excepting in the times. In the centre of Possession Bay, near the bank, it was high water at 3h. 51m. before the moon's passage, and the tide turned to the eastward at noon, or 0h. 39m. after the passage. This observation was made on the day of full moon. The rise was 28 feet, but at an anchorage more to the westward, near the south-west end of the bank, it rose 35 feet, and ran at the rate of six knots and a quarter. In the First Narrow the eastern tide commences at noon, (full and change.)

At the anchorage in Gregory Bay the easterly tide commenced 20 minutes earlier than in the First Narrow. In the Second Narrow the tides are two and a half or three hours later before they turn. To the westward of the Second Narrow high and low water take place regularly with the set of the tide, and the former occurs, at full and change, within a few minutes of noon. The rise and fall is inconsiderable; the greatest we experienced was eight feet.

Strait of Magalhaens, Dawson Island, Admiralty Sound, the Gabriel, Cockburn, and Barbara Channels.

USELESS BAY was examined in the hope of its communicating with the supposed St. Sebastian Channel, of the old charts; but it proved to be terminated by low land, reaching, perhaps, across the country, towards Cape St. Espiritu Santo. It is more than 30 miles deep, and from 12 to 20 wide, and entirely exposed to the south-west. The

north shore affords no shelter, but on the south there is an indentation of the coast line under the hill called Nose Peak, that may possibly afford a sheltered anchorage.

The termination of the flat table ridge, extending to the N. E. from Point Boqueron, a name of Sarmiento's, meaning an opening, is abrupt and very precipitous.

This country abounds with guanacoes, and the Indians are probably more dependent on hunting than fishing for their subsistence, for we observed their fires upon the hills, at a distance from the coast.

DAWSON ISLAND, which fronts Useless Bay, and the deep inlet, called Admiralty Sound, is 46 miles long, and about 20 broad. Its northern extremity, Cape Valentyn, is low, but becomes visible in passing down the opposite shore, between Sandy Point and Freshwater Bay. Mount Graves, however, is seen from a much greater distance. On the western side of the island there are but two places in which vessels can anchor, viz: Lomas Bay and Port San Antonio, but both being on a lee shore, they are not to be recommended. Lomas Bay is a deep bight, sufficiently sheltered from S. W., but quite exposed to the north-west and westerly winds, which, during the winter, are the most prevalent.

Lieutenant Graves remarks that Lomas Bay, although only tolerably sheltered from the prevailing winds, would, from its extent, (six miles deep,) and nature of the bottom, a stiff blue clay, afford good shelter for vessels of any draft or burden. The appearance of the shores also seems to favor such an opinion, for scarcely any drift wood was found thrown up, even in those parts which were most exposed to the surf. Wood is sufficiently plentiful, and water very abundant. This bay appears at certain seasons to be much resorted to by the Indians, for upwards of twenty wigwams were seen near the beach.

Between Lomas Bay and Cape St. Valentyn, there is no landing, even for a boat, excepting at Preservation Cave, which affords only just room enough to beach one of small size.

PORT SAN ANTONIO, which is situated about the centre of the west coast, opposite to San Nicholas Bay, has the appearance of being well sheltered, but during a fortnight that we spent there we experienced so much inconvenience, and even risk, from the violence of the squalls, that we were obliged to secure the vessel with three anchors. We also found some difficulty in leaving it, on account of the baffling winds, as well as the narrow width of the passage, for we went out by the north entrance.

This place received the distinguishing epithet of Port from Cordova, and is described by him to be three-quarters of a mile wide; instead of which, it is scarcely one-third of that width, and deserves the name only of a cove. It is a very unfit place for a ship, or, indeed, for any vessel to enter, especially when there are so many much better places on the opposite or continental shore.

The anchorage is formed by a channel within the islands North Island and San Juan Island, in which, particularly at the north end, are several islets. The anchor may be dropped in from 10 to 15 fathoms, off a small beach in Humming-bird Cove, which is situated on the inner side, and about half a mile from the south end of San Juan Island. From the west end of North Island a reef extends off for a quarter of a mile, and to the southward are two small islets, which may be passed on either side. North Island is separated from San Juan Island by a narrow and impassable strait.

The south entrance is, perhaps, the best, although with a northerly wind the northern should be preferred. There is no danger but what is evident: the ground, however, is not very clean until you reach Humming-bird Cove.

The south entrance is tolerably wide. In entering, haul round the south point of San Juan Island, for near the shore of the eastern side there is a rock under water. Opposite to Humming-bird Cove, in a small bight, there is a stream of fresh water.

PORT VALDÈZ is a deep inlet, fronting W. N. W., and not at all inviting to enter. From the appearance of the hills, squalls must be very frequent, and blow with the greatest violence; for trees are seen torn up by the roots, in long lines, evidently caused by the destructive force of the winds.

The ebb tide sets to the north through the channel.

THE GABRIEL CHANNEL separates Dawson Island from the Tierra del Fuego. It is merely a ravine of the slate formation, into which the water has found its way, and insulated the island. It extends precisely in the direction of the strata, with almost parallel shores. It is 25 miles long, and from half a mile to one mile and a half wide, the narrowest part being in the centre. The north shore is a ridge of slate, rising abruptly to a sharp edge, and then as abruptly descending on the opposite side, where it forms a valley, which, had it been a little deeper, would have been filled by water and have become another channel like the Gabriel.

The south side of the Gabriel Channel is formed by a high mass of mountains, probably the most elevated land in the Tierra del Fuego. Among many of its high peaks are two more conspicuous than the rest, Mount Sarmiento and Mount Buckland. The first is 6,800 feet high, and, rising from a broad base, terminates in two peaked summits,

bearing from each other N. E. and S. W., and are about a quarter of a mile asunder. From the northward it appears very much like the crater of a volcano; but when viewed from the westward, the two peaks are in a line, and its volcanic resemblance ceases. It is noticed by Sarmiento as well as by Cordova, in the journals of their respective voyages. Sarmiento calls it Volcan Nevado, (the Snowy Volcano.)

It is the most remarkable mountain in the strait; but from the state of the climate and its being clothed with perpetual snows, it is almost always enveloped in condensed vapor. During a low temperature, however, particularly with a N. E. or S. E. wind, when the sky is often cloudless, it is exposed to view, and presents a magnificent appearance. From its great height and situation it served our purpose admirably to connect the points of the survey. It was seen, and bearings of it were taken, from the following distant stations, viz: Elizabeth Island, Port Famine, Cape Holland, Port Gallant, and Mount Skyring, at the south entrance of the Barbara Channel.

MOUNT BUCKLAND is, by estimation, about 4,000 feet high. It is a pyramidal block of slate, with a sharp pointed apex, and entirely covered with perpetual snow.

Between these mountains the summit of the range is occupied by an extensive glacier, the constant dissolution of which feeds the innumerable cascades that pour large bodies of water down the rocky precipices overhanging the south shore of the Gabriel Channel.

At the extremity of the channel is Fitton Harbor; and on the opposite side of Cape Rowlett are Port Cooke and Brookes Harbor.

PORT COOKE is a very convenient and useful port. It is sheltered by a high wooded island. The anchorage is off the rivulet on the west side, in 9 fathoms.

BROOKES HARBOR, like Fitton Harbor, is spacious, but not good as a port, for the water is deep, and the anchorages, being in coves, are not easy of access without the labor of towing.

ADMIRALTY SOUND extends for 43 miles to the S. E. into the land of Tierra del Fuego. It is 7 miles wide at the entrance, and gradually diminishes to 3. On its north side the shore is very straight, but the south side has two deep inlets, Ainsworth and Parry Harbors. It terminates in a bay, affording anchorage in from 10 to 15 fathoms, but very much exposed to N. W. winds, which, I should think, from the funnel shape of the sound, would blow with furious strength. On the north side of the bay is Mount Hope, a lofty insulated mass of rock, but to the south of it lies a considerable tract of low land, over which the view was unobstructed for a considerable distance, and was bounded by a distant mountain, in the direction of the position of Captain Basil Hall's Volcano,* in lat. 54° 48′, long. 68°. If the volcano exists, it is most probably the above mountain, but we saw nothing to indicate the appearance of its being in an eruptive state. It is placed on the chart from Captain Hall's authority.

In Ainsworth Harbor there is anchorage at the bottom, on the west side. The mountains at the back of the harbor are capped by an enormous glacier that descends into the sea.

PARRY HARBOR is about five miles deep and three wide. At the entrance on the west side there are two coves, either of which offer a convenient stopping place for a small vessel.

The eastern side of Dawson Island is very much intersected by deep inlets, particularly Brenton Sound, and its termination, Port Owen, which very nearly communicates with Lomas Bay, the dividing land being low and marshy.

The large central island in Brenton Sound, Wickham Island, is high, and there is a remarkably sharp-peaked hill upon it, which is seen in clear weather from Port Famine.

NON-ENTRY BAY was not examined. It appeared to offer snug anchorage. The depth between the points of entrance was from 9 to 19 fathoms.

FOX BAY.—The bottom and south side are shoal, but the banks are indicated by kelp. A rapid stream of water empties itself into the bay. The anchorage in Fox Bay is in from 3 to 5 fathoms. The north head, Steep Tree Bluff, is of bold approach: within 20 yards of the shore the depth is 9 fathoms.

HARRIS BAY is an indenture of the coast, two miles deep.

WILLES BAY, off which is Offing Island, by which it may be known, although of small extent, affords excellent anchorage, upon a mud bottom, in 9 or 10 fathoms. The tide rises and falls about 6 feet. It is high water, at full and change, about 12 o'clock. At the bottom of Willes Bay is Philip Gidley Cove, where a small vessel may lie in perfect security. There are not less than 3 fathoms in the entrance, and inside, in most parts, there is the same depth.

CAPE ST. VALENTYN is the northern extremity of Dawson Island. It is low, and has a small hummock near the point. Between the two points which form the cape there is a slight incurvation of the shore, which would afford shelter to small vessels from any wind to the southward of east or west; but the water is shoal, and the beach, below

* A Loo Choo story, probably. See B. Hall's book.—E. & G. W. B.

high water mark, is of large stones. The coast to the south-west is open, and perfectly unsheltered: it is backed by cliffs. The beach is of shingle.

The opening of Magdalen Sound was first noticed by Sarmiento. Coming from the northward it appears to be a continuation of the strait, and it is not until after passing Cape San Isidro that the true channel becomes evident. It extends in a southerly direction for 20 miles, and is bounded on either side by high and precipitous hills, particularly on the west shore. The eastern entrance of the sound, Anxious Point, is a low narrow tongue of land, with an island off it. Opposite to it is a steep mountain, called by Sarmiento the Vernal, (or summer house,) from a remarkable lump of rock on its summit.

Under this mountain is Hope Harbor, a convenient stopping place for small vessels bound through the sound. The entrance is narrow, with kelp across it, indicating a rocky bed, on which we had not less than 7 fathoms. Inside it opens into a spacious basin, with good anchorage, in 4 fathoms, sheltered from all winds, excepting the squalls off the high land, which must blow with furious violence during a south-westerly gale. This little port is much frequented by Indians, for we found many wigwams on the south side, some of which were occupied by the women and children of a tribe, the men being absent on a fishing excursion.

To the south of Hope Harbor, between the Vernal and Mount Boqueron, is Stokes' Inlet. It is three miles long, with deep water all over: there is a cove on its north side, but neither so good nor so accessible as Hope Harbor. In the entrance of the inlet are three islets, (Rees Islets.)

MOUNT BOQUERON, the extremity of which is Squally Point, is a very precipitous and lofty mountain, about 3000 feet high, and having on its summit three small but remarkably conspicuous peaks. It is the eastern head of Stokes' Inlet, and forms a part of the western shore of Magdalen Sound. The squalls that blow off this during a south-west gale, are most furious, and dangerous unless little sail be carried. On one occasion our decked sailing boat was 7 hours in passing it. The sound here is not more than 2½ miles wide, On the opposite shore, within Anxious Point, is an islet extending to the south-east for 2 or 3 miles, but is narrow and unimportant.

SHOLL BAY is a small bight of the coast line, 5 miles to the south of Squally Point. There is a reef off it, the position of which is pointed out by kelp.

On the opposite shore is Keats' Sound. It extends to the south-east for 6 or 8 miles, and is between 4 and 5 miles wide.

In the centre of Magdalen Sound, abreast of the above opening, is a rocky islet; and at a short distance to the southward, on the western coast, is a bay and group, called Labyrinth Islands, among which small vessels may find good anchorage.

TRANSITION BAY is deep, and of little importance. Four miles farther, at Cape Turn, the shore trends suddenly round. Here Magdalen Sound terminates, and Cockburn Channel commences.

On the opposite shore, to the south of Keat's Sound, there are no objects worth noticing, excepting Mount Sarmiento, which has been already described, and Pyramid Hill, which was found to be 2500 feet high.

The bottom of Magdalen Sound is 6 miles wide, but at Cape Turn the channel narrows to 2 miles, and in one part is not more than 1⅔ mile wide. The south shore is much broken, and there are many sounds penetrating deeply into the land, which, in this part, according to Captain Fitzroy's survey of Thieves Sound, is 7 miles wide. Eleven miles more to the westward, at Courtenay Sound, the width of the peninsula is not more than 3 miles.

WARP BAY, although exposed to southerly winds, is a convenient stopping place: a plan was made of it.

STORMY BAY is a very wild unsheltered place, unfit for any vessel to stop at. At the anchorage the water is deep, 17 to 20 fathoms, and the bottom rocky. The bay is strewed over with shoals, the existence of which is marked by kelp; these narrow the channel so much as to render the entrance and exit both intricate and difficult for any but a small and hardy vessel.

PARK BAY is both very snug and secure, with good anchorage in 12 fathoms, sand and mud. It has the same disadvantage as Stormy Bay, in being on the lee side of the channel, and is, therefore, difficult to leave. There is, however, here, more room to beat out, and no dangers to encounter but what are visible. At the N. E. angle of the bay is a narrow isthmus, not more than 500 yards across, separating it from Mercury Sound, which was not examined. It is laid down from an eye sketch.

In working down the channel, the south side should be preferred, as it is a weather shore, and seems to be better provided with coves and harbors to anchor in.

KING AND FITZROY ISLANDS in mid-channel, are of bold approach; as are also Kirke's Rocks more to the westward.

The flood tide sets to the southward, or to seaward, but was not found to run with suf-

ficient strength, to benefit or impede a vessel beating through. The rise and fall is also inconsiderable, not being more than 6, or at most, 8 feet at spring tides.

There are several anchorages among the Prowse Islands, which are very numerous, and skirt the coast for several miles. Behind them the land trends in, and forms a deep sound. The Adelaide schooner anchored in a bay on the north side of one of the islands opposite to Barrow Head, in 6 fathoms; but there are many places of a similar nature, equally convenient and secure. A vessel, in want of anchorage, should hoist a boat out and wait in the offing until one answering the purpose be found. Entering these deep-water bays, a boat should always be hoisted out, and a hawser kept ready to make fast to the shore. It will be frequently necessary to tow up to the head of the harbors; for from the height of the land, the wind generally fails or becomes baffling.

The distance across the channel, between Prowse Islands and Barrow Head, is scarcely 1½ mile.

DYNELEY SOUND extends for more than 9 miles, in a N. W. direction, into the interior of Clarence Island. On the west side of its entrance is a group of islands, affording several anchorages, which the chart will point out. One of them, Eliza Bay, offers shelter and security from all winds. The bottom of Dyneley Sound was not examined.

MELVILLE SOUND, which forms the embouchure of the Barbara and Cockburn Channels, is very extensive, and is completely filled with islands. Some of them are of large size, and all are of the most rugged and desolate character. The offing is strewed with clusters of rocks: of these the East and West Furies are the most remarkable, as well as the most important; for the passage into the Cockburn Channel lies between them. The former are very near the land of Cape Schomberg. The West Furies bear from the Tower Rock, off Cape Noir, N. 84° E., 25 miles; and S. 30° W., 11 miles from Mount Skyring. The Tussac Rocks, which are two in number, bear from the West Furies N. 73° E., 4½ miles; and in a line between the East and West Furies, 3 miles from the latter, and 2 from the former, is a rock standing alone. It bears from Mount Skyring S. 12° W., 12½ miles. To avoid it, in entering with a westerly wind, pass near the West Furies, and steer for the Tussac Rocks.

After passing these, there are no dangers that we know of in the entrance of the Cockburn Channel. A reference to the plan will show every thing else that need be noted.

Mount Skyring is a very prominent object. It rises to a peak to the height of 3,000 feet; and, being visible for a considerable distance, was useful in connecting the triangulation of the strait with that of the outer coast. It was seen from Field Bay, at the north end of the Barbara Channel; and, from its summit, Capt. Fitzroy obtained a bearing of Mount Sarmiento. Its summit is in lat. 54° 24′ 44″, and long. 72° 7′ 40″. The variation is 25°.

The southern entrance of the Barbara Channel is so very much occupied by islands and rocks, that no direct channel can be perceived. The chart must be referred to as the best guide for its navigation. For small vessels there is neither danger nor difficulty; there are numerous anchorages that they might reach without trouble, and that would afford perfect security.

The land hereabout is also described in Captain Fitzroy's published views of the sea coast of Tierra del Fuego, which contain excellent views of the land from Cape Pillar to its eastern extremity at Cape Diego. Section VII. contains the description of the coast, and references are therein made to the views of the land in Capt. Fitzroy's work.*

Among Magill's Islands there are several coves and anchorages. Tom's Harbor is good and well sheltered, excepting from the violent squalls off the high land, which are so frequent every where among the coves of Tierra del Fuego.

For sealing vessels, however, it is more safe and secure than Fury Harbor, the place they usually frequent. Every thing that Fuegian Harbors afford is to be obtained in it. North Cove was occupied by Captain Fitzroy in the Beagle.

FURY HARBOR, on the S. E. side of the central island of Magill's Group, is a very wild anchorage. From its contiguity to the East and West Furies, and the Tussac Rocks, on which seals are found, it is much frequented by sealing vessels.†

BYNOE ISLAND affords an anchorage on its N. E. side; and Hewett Bay, of which a plan was made, is a good stopping place, either for entering or quitting the channel.

BROWN'S BAY is more extensive, but also affords good shelter in a small cove at the north entrance, in 8 fathoms, sand, among some kelp.

NORTH ANCHORAGE, for a small vessel, is tolerably secure, but not to be recommended.

Between Hewett Bay and North Anchorage the channel is strewed with many rocks

* Views of parts of the sea coast of Tierra del Fuego, taken on board his Majesty's surveying vessel Beagle, 1829 and 1830.

† In the winter of 1826–7, the Prince of Saxe Coburg, sealer, was wrecked in Fury Harbor, and the crew saved by the Beagle's boats.

and shoals, some of which, although covered with kelp, only show at half tide. Much caution is therefore necessary, and all patches of kelp should be carefully avoided.

The tide to the northward of North Anchorage, which to the southward was not of sufficient consequence to interfere with the navigation of the channels, is so much felt as to impede vessels turning to windward against it.

The country here has a more agreeable appearance, being better wooded with beech and cypress trees; but the latter are stunted, and do not attain a greater height than 15 or 18 feet. They are very serviceable for boat-hook spars, boat's masts, &c. The wood, when seasoned, works up well.

BEDFORD BAY is a good anchorage. It is situated on the N. W. side of the narrow part of the channel. Its depth is from 20 to 8 fathoms, good holding ground, and perfectly sheltered from the prevailing winds. At its entrance are several patches of kelp, the easternmost of which has 4 fathoms on it. A plan was made, including the narrow channel; which, as it is a place likely to be frequented by vessels navigating the strait, will be of service.

Here, as well as throughout the Barbara Channel, the flood tide sets to the southward. (Lieutenant Graves MS.)

NUTLAND BAY, having 8 and 15 fathoms over a sand and mud bottom, may be known by two small islands, Hill's Islands, which lie one mile N. N. E. from the anchorage.

Between Bedford and Nutland Bays, and, indeed, as far as the Shag Narrows, the channel is open, and may be navigated without impediment. There are many bays and inlets not here described or noticed, that may be occupied, but almost all require to be examined. They all trend far enough into the land to afford good shelter, but in many the bottom is foul and rocky, and the water too deep for anchorage.

The western coast, being the windward shore, should, of course, be preferred.

FIELD'S BAY is too exposed to southerly winds to be recommended as a stopping place, unless the wind be northerly. Nutland Bay is a more convenient place to start from with a view of passing the Narrows.

To the north of Nutland Bay is Borderip Bay; at the bottom, or northern part of it, are some good coves; but the most convenient of them is at the eastern extreme: it is called on the chart Dinner Cove. It extends to the north for about a furlong, and affords good anchorage in 10 fathoms, sufficiently well sheltered and distant from high land to be free from the mountain squalls, or williwaws.

Round Dinner Cove is Icy Sound, a deep inlet, with a glacier of considerable extent at the bottom, from which large masses of ice are constantly falling, and drifting out, occupy the waters of the inlet. The water is deep, and the anchorage not good, when there are so many better places. Dean Harbor is a considerable inlet trending in under the same glacier, which extends from the head of Smyth Harbor to a considerable distance in the south-west. If of a favorable depth it might afford good anchorage. We did not enter it.

The only navigable communication that exists between the Barbara Channel and the strait, is that called the Shag Narrows, on the western side of Cayetano Island. The width of the opening is at least one mile and three-quarters, but the eastern portion is so filled with rocky islets and shoals, that the actual breadth of the only navigable part at the northern end, is about 100 yards; and the widest part, at the south end, scarcely half a mile—the whole length of the passage being rather less than 2 miles. It is formed on the west side by a projecting point of high land, that gradually trends round to the westward; and on the opposite side by three islands, the northernmost of which is Wet Island; on the southernmost is Mount Woodcock, one of our stations for the triangulation.

Between Wet Island, where the Narrows on the north side commence, and the western shore, the width is not more than 100 to 150 yards, and perhaps 300 yards long. Through this the tide sets as much as 7 miles an hour: the sides of the rocks are steep to; so that I apprehend no accident can happen to a ship in passing them, notwithstanding the want of room for manœuvring. At the south end of Wet Island, the stream of tide divides; one sets to the eastward, round Wet Island, whilst the principal runs through the Shag Narrows. And in the same manner, a part of the southern tide, which is the flood, after passing Wet Island, runs to the S. E., round the eastern side of Mount Woodcock.

All the space to the eastward of Mount Woodcock is so strewed with islands and rocks, that the passage must be difficult, if not dangerous.

To avoid the danger of being thrown out of the Narrows, it is only necessary to keep the western shore on board: where there are no indentations, the tide will carry a vessel along with safety. At the north end of the Narrows, on the west side, is a shelving point, on which there are 5 fathoms; here is an eddy, but as soon as the vessel is once within the Narrows, (within Wet Island,) the mid-channel may be kept. In shooting this passage, it would be better to furl the sails and tow through, for if the wind be

strong, the eddies and violent squalls would be very inconvenient, from their baffling, and laying the vessel upon her beam ends; which frequently happens, even though every sail be furled. It will be necessary to have a couple of boats out, ready, either to tow the ship's head round, or to prevent her being thrown by the tide into the channel to the south of Wet Island.

If anchorage be desirable after passing the Narrows, there is none to be recommended until the coves between Smyth Harbor and Cape Edgeworth be reached.

Of these Dighton Cove is preferable. The anchorage is off the sandy beach, in 20 fathoms.

Warrington Cove, the next to the north, also offers good shelter and anchorage, but both are exposed to easterly winds.

The tide in the Shag Narrows, at full and change, commences to set to the southward at 12 o'clock. In the Barbara Channel the flood tide was found by Lieutenants Skyring and Graves to set to seaward, or to the southward; as was also the case in Cockburn Channel. Our experience of the tides hereabouts was not sufficient to justify our making any further observations upon them.

SMYTH HARBOR is about 4 miles deep, and a half to one mile wide, surrounded by high land, and trending in a westerly direction. The water is deep, excepting in Earle Cove, on the north side, where vessels might lie, if necessary; but I should think it a very wild place in bad weather.

The hills at the head are capped by glaciers that communicate with those at the head of Icy Sound. It seems possible that all the mountains between this and Whale Sound are entirely covered with a coating of ice.

Half a mile S. E. from Cape Edgeworth is a shoal, so thickly covered with kelp as to be easily seen in passing or approaching it; there are not more than two feet of water over its shoalest part.

To pass through the Barbara Channel from the north, it would be advisable to stay at Port Gallant until a favorable opportunity offers; for with a S. W. wind it would neither be safe nor practicable to pass the Shag Narrows.

The N. W. wind prevails more than any other in the western portion of the strait, in consequence of the reaches trending in that bearing. It seems to be a general rule hereabouts that the wind either blows up or down them.

Between Cape Froward and the western entrance of the strait, the wind is generally from N. W., although at sea, or in the Cockburn or Barbara Channels, it may be in the south or south-western boards.

Strait of Magalhaens, from Port Famine to Cape Froward, the North Coast of Clarence Island, and from Cape Froward to the Jerome Channel.

The Sedger River, which is fronted by a bar that dries at low water, can be entered by boats at half tide, and is navigable for 3 or 4 miles; after which its bed is so filled up by stumps of trees, that it is difficult to penetrate farther. The water is fresh at half a mile from the entrance, but to ensure its being perfectly good, it would be better to fill the casks at low tide. The low land near the mouth, as well as the beach of Port Famine, is covered with drift timber of large size, which we found very useful and serviceable for repairing our boats.

The river was called by Sarmiento, Rio de San Juan. In Narborough's Voyage it is called Segar's River, and his boat is described to have gone up it for 9 (?) miles; but was there stopped from going farther by "reason of the trunk timber and shoaliness of the water." Byron describes the river, which he calls the Sedger, in glowing terms, but gives rather a more flattering account of the timber growing on its banks than it deserves.

Voces Bay, or the Playa-de-las-Voces of Sarmiento, is to the southward of the south point of Port Famine, where the Sedger River falls into the sea. A ship may anchor in from 7 to 10 fathoms off the Second River, but the shelter is not as good as in Port Famine. The Second River has a shoal entrance, but extends for some distance up the valley.

Between this bay and Cape St. Isidro, (Point Shut-up of Byron,) the water is too deep for anchorage, even close to the beach. The cape is the termination of the ridge, whose summit is Mount Tarn, the most conspicuous mountain of this part of the strait. It is 2602 feet high by barometrical measurement. It is readily distinguished from abreast of Elizabeth Island, whence it appears to be the most projecting part of the continental shore. When viewed from the northward its shape is peaked, and during the summer it has generally some patches of snow a little below its summit; but in the winter months its sides are covered with snow for two-thirds down. From abreast and to the southward of Port Famine, it has rather a saddle-shaped appearance; its summit being a sharp ridge, extending very nearly for one mile N. W. and S. E., with a precipitous descent on the N. E., and a steep slope on the S. W. sides. The highest peak, near its N. E. end, is in lat. 53° 45′ 6″, and long. 70° 58′ 26″.

There is a low, but conspicuous rounded hillock, covered with trees, at the extremity of Cape San Isidro; and a rocky patch extends off it for 2 cables' length, with a rock at its extremity that is washed at high water. It is covered with kelp.

EAGLE BAY, (Valcarcel Bay of Cordova,) is about three quarters of a mile deep; and its points one mile apart, bearing N. E. and S. W. The anchorage is at the head, in from 20 to 12 fathoms. There are two streams of water; but, being very much impregnated with decomposed vegetable matter, cannot be preserved long. The woods here abound with Winters Bark, of which there are many very large trees. A small reef extends for about a cable's length off the S. W. point of the bay, on which is an islet. Eagle Bay is not useful for any but a small vessel, that can be towed in, and then it will be necessary to steady her by warps to the shore. The squalls, or williwaws, at times, are very violent.

GUN BAY, the next to the westward, although small, affords anchorage for a single vessel, near the shore, at its S. W. part, in from 8 to 9 fathoms. Its points bear S. 57° W., and N. 67° E., and are distant more than three quarters of a mile. Two rivulets discharge themselves into it, from which water is easily procured. The bottom is a stiff clay, and good holding ground. A round hill of moderate elevation, and thickly wooded, separates it from Indian Bay, the points of which bear S. 69° W., and N. 69° E., and are distant more than 1¼ mile. From the east point the shore runs due west, curving round at the bottom towards an islet covered with trees; between which and the shore there is only sufficient depth for a boat to pass. A rock about 12 feet high lies to the S. E., on either side of which is an anchorage, sufficiently sheltered from the prevailing winds, over a good bottom, in from 7 to 9 fathoms. The north side of the bay is shoal, caused, probably by the alluvial deposit from a river nearly in the centre. A patch of kelp extends off the S. E. point, for 2 cables' length, but has 9 fathoms over it at the centre.

Neither Gun nor Indian Bays are noticed in Cordova's description of the strait, although they are quite equal to any other in the neighborhood, for stopping places.

BOUCHAGE BAY, which is Cordova's Cantin Bay, is small, and the water very deep, except near the bottom, where anchorage may be obtained in 8 fathoms, clay. It is separated from Bournand Bay, (Gil Bay of Cordova,) by Cape Remarquable, of Bougainville, which is a precipitous round-topped bluff projection, wooded to the summit. At two cables' length from the base no bottom was found with 20 fathoms of line, but at the distance of 50 yards the depth was 20 fathoms. Bournand Bay is more snug and convenient than its northern neighbor, Bouchage Bay, being sheltered from the southerly winds by Nassau Island. At the S. W. end of a stony beach at the bottom, is a rivulet of good water, off which there is good anchorage, in 8 fathoms, stiff mud.

BOUGAINVILLE BAY (Cordova's Texada Bay) forms a basin, or wet dock, in which a vessel might careen with perfect security. It is, from its small size, great depth of water, and the height of the land, rather difficult of access, which renders it almost always necessary to tow in. On entering, the anchor should be dropped in 12 fathoms, and the vessel steadied by warps to the trees, at the sides and bottom of the cove. It is completely sheltered from all winds, and an excellent place for a vessel to remain at, particularly if the object be to procure timber, which grows here to a great size, and is both readily cut down and easily embarked. A rivulet at the bottom affords a moderate supply of water; but if more be required, the neighboring bays will afford an abundance.*

In the passage between Nassau Island and the main, the least water is 7 fathoms, over a stiff clay bottom, gradually deepening on each side. But the winds being baffling, and the tides irregular and rippling in many parts, a vessel should not attempt it but from necessity.

NASSAU ISLAND'S south extremity is Sarmiento's Point, Santa Brigida.

ST. NICHOLAS BAY, so named by the Nodales, in 1618, (but previously, by Sarmiento, Bahia de Santa Brigida y Santa Agueda, and French Bay, by De Gennes,) is not only of larger size than any of the bays to the south of Cape San Isidro, but is the best anchorage that exists between that cape and Cape Froward, as well from its being more easily entered and left, as from the moderate depth of water, and extent of the anchoring ground. Its points bear from each other S. 58° W., and N. 58° E., and are distant two miles. Nearly in the centre is a small islet covered with trees, between which and the shore is a passage with 9 fathoms water, stiff clay. The shore is, however, fronted for its whole length by a shoal bank, which very much reduces the apparent extent of the bay. This bank stretches off to the distance of a quarter of a mile from the shore, the edge of which is steep to, and is generally distinguished by the ripple, which, with a moderate breeze, breaks at half tide. The Beagle anchored in the bay, at 3 cables' length to the N. E. of the small central islet, in 12 fathoms, pebbly bottom; but the best berth is one-quarter to one-third of a mile to the S. W. of the

* It was here that M. de Bougainville cut timber for the French colony, at the Falkland Islands. To sealing vessels it is known by the name of Jack's Harbor.

islet, in 10 or 11 fathoms, muddy bottom. Captain Stokes recommends, in his journal, in coming in, to keep sail upon the ship, in order to shoot into a good berth, on account of the high land of Nodales Peak becalming the sails; and to avoid the drift of the stream of the river setting the ship over to the eastern side of the bay. I do not, however, think that the stream of the river can affect a ship in any position between the islet and the peak. In taking up an anchorage, much care is necessary to avoid touching the bank. Less than 10 fathoms is not safe, but in that depth the security is perfect, and the berth very easy to leave. In passing through the strait this bay is very useful to stop at, as well from the facility of entering and leaving it, as for its proximity to Cape Froward. The islet is in latitude 53° 50′ 38″, and longitude 71° 3′ 13″.

In the middle of the bay is De Gennes River, (Rio del Valle Grande of Sarmiento,) which is of a larger size than Sedger River. It is 100 yards across, and apparently extends in a winding direction up the valley for some distance. From its entrance being fronted by a shoal or bank, the form of which must be constantly shifting, and its being strewed with trees that drift out of the river during the winter freshes, it is far from being an eligible place for procuring water.

From Glascott Point, the southern head of the bay, a mountainous and high range of hills runs back for some distance. On its summit are several sharp peaks, the most conspicuous of which is Nodales Peak.

From Glascott Point the coast extends in nearly a straight line to Cape Froward, a distance of 7 miles, the land at the back continuing mountainous and woody. A point, formed by a beach of shingle, covered with trees to within 20 yards of the water's edge, and distant nearly 3 miles from Cape Froward, is the only projection. Between this and the entrance of a rivulet, which waters the only valley that exists in this space, an achorage at a quarter of a mile from the shore, in 11 fathoms, might be occupied during a westerly wind; but with the wind more southerly, it would be too much exposed to be safe. The Beagle anchored here at 2 cables' length off the sandy beach, in 11 fathoms.

CAPE FROWARD, the southern extremity of the continent of South America, rises abruptly from the sea. At its base is a small rock, on which Bougainville landed, as did Lieut. Graves, for the purpose of obtaining a set of bearings. The hill that rises immediately above the cape, was called, by Sarmiento, the Morro of Santa Agueda. Cape Froward is in lat. 53° 53′ 43″, long. 71° 14′ 31″. The ebb tide sets to the northward, and the flood to the southward, but with very little strength. It is high water, at full and change, at 1 P. M.*

The north coast of Clarence Island extends from the entrance of Magdalen Sound to that of the Barbara Channel, the whole length of which is indented by sounds stretching deeply into the island.

BOUGAINVILLE'S PORT OF BEAUBASIN, (the Bahia Darsena of Cordova,) is sufficiently pointed out by the small rocky islet called Periagua, and the mountain of the Vernal, before described. The outer part of the port decreases in width, gradually, to the entrance of the harbor, which is formed by two projecting points, a very short distance apart, and is very shoal, the deepest water being only 2¾ fathoms. Inside, in the basin, there are 5 fathoms. It is a very snug place when once in, but possesses no advantage, since it is on the wrong side of the strait for vessels bound through to the westward; for the northerly or easterly wind, which would be favorable to proceed, would prevent a vessel sailing out of it.

INMAN BAY, HAWKINS BAY, STAPLES INLET, AND SHOLL HARBOR, are all deep inlets, surrounded by high precipitous land.

To the westward of Greenough Peninsula, is Lyell Sound. It is 9 miles deep, and is separated at the bottom from Sholl Harbor by a ridge of hills about one mile and a half wide.

In the entrance of Lyell Sound, are two conspicuous islands, one of which is very small. They are called Dos Hermanas, and bear from Cape Froward S. 48° W., five miles and a half.

KEMPE HARBOR, one mile and a half within the entrance, on the west side of Lyell Sound, is rather difficult of access, but perfectly secure, and would hold six ships. Stokes Creek, on the same side, more to the southward, also offers good anchorage; but from its being out of the way, can be of no utility.

CASCADE HARBOR, AND MAZZAREDO BAY, are of less size, and therefore more attainable, but of the same character with Lyell Sound, viz., deep water, surrounded by high land. The former is known by the cascade which M. de Bougainville describes, from which it derives its name. On the headland that separates these harbors from Lyell Sound, is a sugar-loaf hill, the position of which is well determined, in lat. 53° 57′ 32″, long. 71° 24′ 13″.

HIDDEN HARBOR has a narrow entrance, but, if required, offers good shelter.

* Byron found the depth of water, at less than a cable's length from the point, 40 fathoms. Midway between St. Nicholas Bay and Port San Antonio, we had no bottom with 256 fathoms.

SAN PEDRO SOUND is the most extensive inlet that we know in Clarence Island. It extends in a southerly direction for nearly 13 miles, and has three other inlets branching off into the land, two to the westward and one to the eastward. There is a good, although a small anchorage on its west side, one mile and a half within the entrance, called Murray Cove, and another close to it, which is even more sheltered.

FRESH WATER COVE, the Caleta de Agua dulce of Sarmiento, is a confined and indifferent place for a ship.

BELL BAY (the Bahia de la Campana of Sarmiento) has a very prominent anchorage, Bradley Cove, on its west side, bearing S. 79° W. from Point Taylor, the eastern head of the bay. It will readily be distinguished by a small green round hillock that forms its north head. The anchorage is in 17 fathoms, and the vessel hauls in by sternfasts or a kedge into 9 fathoms, in perfect security. Pond Bay, to the northward, has good shelter, but it is not of such easy access, for it would be necessary to tow both into and out of it.

MOUNT POND, a peaked hill over the harbor, is a conspicuous mountain, and is visible from the eastward as soon as it opens round Cape Froward. It has two summits, one of which only is visible from the eastward.

Between Cape Inglefield and Point Elvira is St. Simon's Bay. It is studded with islands and rocks, and at the bottom has two communications with the Barbara Channel, separated from each other by Burgess Island, the easternmost of which, called Tom's Narrows, is the most extensive; but this, from the irregularity and force of the tides, is not to be preferred to the more direct one of the Shag Narrows, on the western side of Cayetano Island; for there is no good anchorage in St. Michael's Channel, which leads to it, and it is bounded by a steep and precipitous coast. The Gonsalez Narrows on the west side of Burgess Island is not more than 30 yards across, and from the force of the tide and the fall of the rapid, would be dangerous even for a boat to pass.

The only good anchorage in St. Simon's Bay is Millar's Cove. It is about 3 miles within Point Elvira, and has three rocky islets off its entrance. A conspicuous mount forms the summit of the eastern head. The anchorage is in 5 fathoms, a good bottom, and entirely sheltered. Wood and water are plentiful.

Immediately round the east head of Miller's Cove is Port Langara. It is rather more than a mile long, and two-thirds of a mile wide, and trends in a W. N. W. direction. The water is deep, excepting at the head, and in a cove on the north shore, in either of which there is good anchorage. At the former the depth is 8 fathoms, and in the cove 5 fathoms. On the eastern side of the bay are Shipton and Mellersh Coves. Both are surrounded by high land, and the water being very deep, neither of them afford anchorage. Off the head that divides them are the Castro Islands. On the north side of the largest is a very convenient cove, with a moderate depth of water. The Castellano Islands consist of five principal ones. They are situated in the centre of the bay, and have no anchorage among them.

The coast from Cape Froward to Jerome Channel, a distance of 40 miles, is very slightly indented. The anchorages, therefore, are few in number, but they are of easier access, and altogether more convenient than those of the southern shore. Taking them in succession, Snug Bay, 5 miles N. W. of Cape Froward, is a slight indentation of the coast at the embouchure of a small rivulet, the deposites from which have thrown up a bank near the shore, on which anchorage may be had in 8 and 9 fathoms. The best anchorage is half a mile to the E. S. E. of the island, in 9 fathoms, black sand, the rivulet mouth bearing N. N. W., three-quarters of a mile. It is much exposed, being open from W. S. W. by S. to S. E.*

Byron, who anchored in it, describes it as being fit for his purpose. It is certainly a convenient stopping place in fine weather.

WOOD'S BAY, situated under the lee of Cape Holland, is a convenient stopping place for ships, but only small vessels should anchor inside the cove. The anchorage is very good to the eastward of the river's mouth, at half a mile from the shore, in 17 and 13 fathoms water. Small vessels may enter the cove, by luffing round the kelp patches that extend off the south point of the bay, on which there are 2½ fathoms.

Entering Wood's Bay, steer for the gap or low land behind the cape, and as you near the south point, keep midway between it and the river's mouth; or, for a leading mark, keep a hillock, or conspicuous clump of trees, at the bottom of the bay, in a line with a remarkable peak, one or two miles behind, bearing, by compass, N. 52° W. Anchor in 17 fathoms, immediately when you are in a line between the two points. Small vessels may go farther, into 12 fathoms. The west side of the cove may be approached pretty near, and the depth will not be less than 5 fathoms, excepting upon the two fathoms patch that stretches off the east point, the extent of which is sufficiently shown by the

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Snug Bay.—At Byron's Anchorage, in Snug Bay, "Cape Froward bore E. ½ S., 5 miles; the islet in the bay W. by S., half a mile; the river's mouth N. W. by W., three-quarters of a mile. Shoaled suddenly from 17 to 9 fathoms, but had no ground until near the island."

kelp; but on the eastern side the bank shoals suddenly, and must be avoided, for there are 13 fathoms close to its edge, upon which there are not more than 2 feet water. The south point of Wood's Bay is in lat. 53° 48′ 33″, and long. 71° 35′ 41″.

CAPE HOLLAND is a bold, high, and, although slightly projecting, yet a very conspicuous headland. It is precipitous, and descends to the sea in steps, plentifully covered with shrubs. It is 14 miles to the westward of Cape Froward.

Near Cape Coventry, and in Andrew's Bay, anchorage may be had near the shore, if the weather be fine. To the westward of the former, at half a mile from the shore, there are 13 fathoms.

CORDES BAY, four miles to the eastward of Cape Gallant, may be known by the small bright green islet (Muscle Island) that lies in the entrance; also by a three-peaked mountain, about 1,500 or 2,000 feet high, standing detached from the surrounding hills, at the bottom of the bay. The western entrance, which lies between West Point and the reef off Muscle Island, is two-thirds of a mile wide. Within it is a bay one mile deep, but much contracted by shoals covered with kelp. Between them, however, the anchorage is very good and well sheltered. The bottom is of sand, and the depth 5 and 7 fathoms. At the extremity of the bay is a large lagoon, Port San Miguel, trending in a N. E. direction for 2 miles, and two-thirds of a mile across. The entrance is both narrow and shoal, and not safe for a vessel drawing more than 6 feet. Inside the lagoon the depth is from 3 to 13 fathoms. With Fortescue Bay and Port Gallant so near, the probability is that it will never be much used; but in turning to the westward it would be better to anchor here than lose ground by returning to Wood's Bay. By entering the western channel, and steering clear of the kelp, a safe and commodious anchorage may easily be reached.

FORTESCUE BAY is the first best anchorage to the westward of St. Nicholas Bay. It is spacious, well sheltered, easy of access, and of moderate depth. The best berth is to the S. E. of the small islet, outside of Wigwam Point, in 7 or 8 fathoms. Having the entrance of Port Gallant open, small vessels may sail into the port, but the channel is rather narrow. The banks on the western side, off Wigwam Point, are distinguished by the kelp.

When within, the shelter is perfect; but Fortescue Bay is quite sufficiently sheltered, and much more convenient to leave. In this part of the strait, as the channel becomes narrowed by the islands, the tides are much felt. There are two good anchorages before reaching the entrance of the Gerome Channel, namely, Elizabeth Bay and York Roads, off Batchelor's River. They are, however, only fit for stopping places. There are no anchorages among the islands that can be recommended, excepting in the strait that separates the group of Charles' Islands, in which there is security and a convenient depth. When the wind blows fresh, there is a hollow sea between Charles' Islands and the north shore, which very much impedes ships beating to the westward.

At a short distance to the E. S. E. of Passage Point is a shoal, with 2 fathoms upon it. Elizabeth Bay has a sandy beach, and a rivulet emptying itself into it. Cordova recommends the best anchorage to be in 15 fathoms, Passage Point bearing E. S. E., distant half a mile, about 3 cables' length from the river, and to the N. W. of a bank on which there is much kelp.*

Captain Fitz Roy describes the anchorage of York Roads, or Batchelor's Bay, to be good and convenient: "Half a mile off, a woody point, (just to the westward of the river,) bearing N. 6° E., and the mouth of the river N. E., three-quarters of a mile, is a good berth, because there is plenty of room to weigh from, and space to drive, should the anchor drag. The bottom is good in 10 or 12 fathoms, but not in a less depth. The shore is a flat shingle beach for 2 miles, the only one in this part of the strait." Cordova recommends the following as the best anchorage, at half a mile from the beach, the river bearing N. 5° E., and the west point of the bay N. 27° W.

The set and change of the tide here are very uncertain, on account of the meeting of the Gerome Channel tides with those of the strait, which occasions many ripplings; and it would require a better experience than we possess to give a correct explanation. Capt. Fitz Roy says, that "the tide along shore, near Batchelor River, changed an hour later than in the offing. At Batchelor's Bay, by the beach, during the first half or one-third of the tide that ran to the S. E., the water fell; and during the latter half, or two-thirds, it rose. In the offing it ran very strong." The establishment of the tide at the entrance of the river, by an observation made by Captain Fitz Roy, with the moon eight days old, would be, at full and change, at 1h. 46m. By an observation made by Captain

* Mr. Simpson describes the Dolphin's Anchorage here in 10 fathoms. Rupert's Island bore S. by E., 2 or 3 miles; Passage Point S. E. by S., three-quarters of a mile; the west part of the bay W. by N., 2 miles, and a reef of rocks about a cable's length from the shore N. W. by W., a quarter of a mile. The reef is quite covered at high water. Here the flood set to the eastward, and flowed, at full and change, until 12 o'clock.

Stokes, two years previous, it was found to be 2h. 13m. The tide at the anchorage ran three knots.

BATCHELOR RIVER is accessible to boats only; and in going into or out of its entrance, they must be very careful to follow exactly the course of the stream, for a bar lies outside. Large boats cannot enter at half tide.*

To the following islands in the centre of the strait, that form the south limit of English Reach, I have restored the names that were originally given by Sir John Narborough.

SECRETARY WREN'S ISLAND is a small rocky islet, rising abruptly on all sides, and forming two summits. Near it are some rocks, and to the S. E. is a group of small rocks; and at a mile to the E. S. E. are two rocks above water, called Canoas. The islet has no name on Cordova's Chart.

CHARLES' ISLANDS, besides some smaller islets, consist of three principal islands; and in the centre there is a very good port, having good anchorage within the islets, in 13 fathoms. It has an outlet to the N. W., and one to the S. W., also a narrow point communicates with the strait to the S. E.

Opposite to Cape Gallant, on the eastern island, near its N. W. end, is a conspicuous white rock, called Willis' Mark. Next to the westward, in succession, are Monmouth and James Islands, (called by Cordova Isla de los Infantes,) then Cordova Islet, and Rupert's Island, and to the westward of these the island of Carlos III., so named by Cordova. The last is separated from Ulloa Peninsula by St. David's Sound, which is navigable throughout.

To the northward of Whale Point, the eastern extremity of Carlos III. Island, is a cove with an anchorage, in 15 fathoms, close to the shore, on a steep bank, but bad ground. The Beagle and Adelaide both dragged off the bank, from the violence of the squalls off the high land. From the north point of the cove to Rupert's Island is a rocky ledge, (Lucky Ledge,) over which the tide sets with considerable strength. The Beagle, having dragged her anchor in the cove, was brought up by its hooking a rock on the ledge, but it was found broken on being hove up. Whilst there, the tide set past her in a north and south direction, at the rate of three knots an hour.

To the westward of Cape Middleton, of Narborough, is Muscle Bay, having deep water, and of uninviting character. Cordova describes it to be a mile wide, with unequal soundings, from 12 to 40 fathoms, stones. This bay is not to be recommended, although it appears to be well sheltered. There is an anchorage in from 15 to 30 fathoms in Bonet Bay, of Cordova, close to Carlos III. Island. It lies under the S. E. side of some islands opposite to Batchelor River. At a short mile to the eastward of Cape Crosstide, the N. W. end of Carlos III. Island, is Tilly Bay, but it has nothing to recommend it, particularly when the much better anchorage off Batchelor River is so close at hand.

CHOISEUL BAY AND NASH HARBOR, on the Fuegian Coast, are not in the least inviting; the former, Captain Fitz Roy describes to be a large, deceiving, harbor-like bay, full of islets and patches of kelp, under which, of course, there are rocks. Between the islets, the water is deep and unfit for anchorage.

NASH HARBOR is equally unserviceable.

WHALE SOUND, also on the Fuegian shore, at the back of Ulloa Peninsula, is a large inlet, trending eight miles into the land, and terminating in a valley bounded on each side by high mountains. There is anchorage only in one place, the west side of Last Harbor; and, although this harbor appears large, the anchorage is small, and close to the shore.

ST. DAVID'S SOUND separates Carlos III. Island from Ulloa Peninsula. At its north end the water is deep, but where it begins to narrow, there are soundings in it, on which anchorage might be found, if there was a necessity; but I cannot imagine such an occasion will ever happen: should it, the chart will be a sufficient guide.

Strait of Magalhaens, Jerome Channel, Otway and Skyring Waters, Crooked and Long Reaches.

THE JEROME CHANNEL was only slightly examined by Cordova's officers; for, their object being merely to confirm or disprove Sarmiento's statement of the insularity of the land between it and the Gulf of Xaultegua, now called Croker Peninsula, † the Lago de la Botella was alone explored by them. The continuation of the Jerome, named in the old charts Indian Sound, having never been traced; and, therefore, being an object of great interest, it was investigated by Captain Fitz Roy as carefully as could be done in the middle of winter in an open boat. The period of his absence from the ship, how-

* "At three-quarters of a mile to the eastward of Batchelor River, is a shoal which has not more than 8 feet upon it at low water, and 14 feet at high water. It is about half a mile from the shore, and shows itself by the weeds upon it."

† Sarmiento describes it to be an island by the Indian name of Cayrayxayiisgua.

ever, 32 days, not being sufficient to complete the service, the western shores of the Skyring Water were not visited; and as a further examination of it will, probably, be one of the objects of the voyage he is now preparing for, a brief description will be sufficient.

THE JEROME CHANNEL is narrow, but throughout, free from danger. The western shore is high and steep, and covered with trees: the eastern shore is lower and less wooded. In mid-channel, near its western end, are two islets which have no place in the Spanish Chart, unless the Teran Isles be intended to represent them; if so, they are badly placed. The Spanish Chart makes the channel 6 miles too long.

On the west side of the Jerome are 2 coves, Wood Cove and Seal Cove, that may be used with advantage by small vessels. On the eastern shore, the bights, Three Island Bay, (Cordova's Real Cove,) and Coronilla Cove, appeared to be commodious. Arauz Bay is open and exposed to the N. W.

Where the Lago de la Botella joins the Jerome, the latter winds round the north-east. On its eastern side, behind the False Corona Isles, is Cutter Cove, affording anchorage for a small vessel; a plan was made of it. Opposite is Nunez Creek, with deep water.

Abreast of the Corona Isles, one of which, the Sugar loaf, is about 200 feet high, is Sulivan Sound, penetrating for five miles into the land on the western side of the channel; and at a league to the northward of the Sugar loaf, is another opening to the westward; on the north shore of which is Bending Cove; which, with Cutter Cove, are the only stopping places between Cape Forty-Five and Child's Bluff.

Between Child's Bluff and Point Stokes, the Otway water commences. On the west shore it affords several commodious anchorages. Off Point Villiers, lat. 53° 9′, at a quarter of a mile from the shore, there are from 10 to 30 fathoms; and the depth decreases in advancing more northerly. There is anchorage all across the north-east part of the water, in from 5 to 20 fathoms, the bottom of sandy mud.

Inglefield and Vivian Islands, at the west end of the water, are low, but thickly wooded. An isthmus, 6 to 10 miles across, separates the Otway Water from the strait near Elizabeth Island. From an elevated station on the north side of Fitz Roy Channel, this narrow neck appeared to be low and much occupied by lagoons. The south shore of Otway Water is formed by high land, with three deep openings that were not examined. Brunswick Peninsula, a mass of high mountainous land, is the most southern extremity of the continent.

In lat. 52° 40′, and long 71½° W. is the east entrance of Fitz Roy Channel; it forms a communication between the Otway and the Skyring Waters, and takes a winding course to the N. W. for 11 miles, which is easily navigated. A strong tide running during the neaps at the rate of five or six miles an hour in the entrance, and two or three in other parts, sets through it, six hours each way. The rise and fall, however, were scarcely distinguishable.

SKYRING WATER, is 10 leagues long from east to west. Its shores are low. At the western extremity two openings were observed to wind under a high castellated-topped mountain, (Dynevor Castle,) which were supposed by Captain Fitz Roy to communicate with some of the sounds of the western coast. Through Euston Opening, the southern one, no land was visible in the distance; but, on a subsequent examination of the termination of the Ancon sin Salida of Sarmiento, by Captain Skyring, no communication was detected.

Of the TIDES in the JEROME and INTERIOR WATERS.—The tide was found to set through the Jerome Channel with great regularity, six hours each way. The Spanish account, however, says, "The current is always in the direction of the channel, but rarely sets to the N. W., particularly in mid-channel and the western shore; on the opposite side, however, the tide sets six hours each way, to the N. W. and S. E."

The following observations were made by Captain Fitz Roy for the time of high water, at full and change, at various parts of the Jerome and its interior waters, viz: in the entrance of the Jerome, near Arauz Bay, at 1 o'clock; near Bending Cove, at 3 o'clock: at Cutter Cove, at 4 o'clock; on the south shore of Fanny Bay, at Gidley Island, as also at Martin Point, at 5 o'clock; at Inglefield Island at 4 o'clock; and at the same hour at the eastern entrance of Fitz Roy Channel; but at the western end of it at 1h. 15m. The variation of the compass was found to be, at the

Point of Islets,	23° 58′
Donkin Cove,	23° 40′
Wigwam Cove,	23° 34′
Inglefield Island,	23° 56′
Point Martin,	23° 58′

The mean of which will be 23° 49′.

The portion of the strait comprised between the western extremity of Ulloa Peninsula and the entrance of the Jerome is called Crooked Reach. In the navigation of this part Wallis and Carteret suffered extreme anxiety; and no one that has read their journals would willingly run the risk of anchoring in any port or bay on its southern shore. The chart will show several inlets deep enough to induce any navigator to trust to them; and,

probably, for small vessels, many sheltered nooks might be found, but they have all very deep water, and when the wind blows strong down to Long Reach, they are exposed to a heavy sea and furious wind. The anchorage of Borja Bay, within the Ortiz Islands, (the Island Bay of Byron,) is so much preferable, that it alone is to be recommended. Both Capt. Stokes and Capt. Fitz Roy speak highly of it in their journals: it is snug and well sheltered, and tolerably easy of access, but in a gale, like its neighbors, the anchorage is much incommoded by the willi-waws, which "drive the ship from one side to the other, as if she were a light chip upon the water." Captain Fitz Roy says, "let me recommend Borja Bay as an excellent, although small, anchorage: wood and water are plentiful; under the coarse upper sand is a stiff clay, like pipe clay. Avoid the islet off its west side, as you go in or out."

As this is an anchorage that may be much used, Captain Stokes' account of it is also subjoined:

"BORJA BAY is situated on the northern shore of Crooked Reach, two miles to the eastward of Cape Quod. Its position is pointed out as well by the islet off its west point, as by its situation with respect to El Morrion, the hemlet-shape point previously called by the English, St. David's Head. The entrance to the bay is to the eastward of the largest islet, and presents no dangers; all the islets and shores of the bay may be approached to half a cable's length, even to the edge of the kelp. The only difficulty that impedes getting into the bay, arises from the baffling winds and violent gusts that occasionally come off the mountains and down the deep ravines which form the surrounding coast, and the utmost vigilance must be exercised in beating in under sail to guard against their effects. The anchorage is perfectly sheltered from the prevailing winds, the westerly and south-westerly gales, and is open only to south-easterly winds, which very rarely blow here, and still more rarely with violence; and as the holding ground is good, (small stones and sand,) and the depth of water moderate, (14 to 16 fathoms,) and any fetch of sea prevented by the narrowness of the strait in this part, the greatest breadth being only three miles, it may be pronounced a very good and secure harbor. The best plan is to anchor with the bower, and steadied to the shore by a hawser or a kedge. No surf or swell obstructs landing any where: good water and plenty of wood are easy to be embarked: the trees, a species of beech, are of a considerable size. The shores are rocky, and the beach plentifully stocked—as indeed are all parts of the strait to the eastward—with barberries and wild celery."

Byron anchored in Borja Bay, as did also Carteret, in the Swallow. The former gives a plan of it, and calls it Island Bay. He attempted to anchor in it, but was prevented by the strength of the tide.

Captain Stokes describes the Morrion, or St. David's Head, to be a lofty granitic rock, of which the outer face is perpendicular and bare, and of a light grey color, distinguishable from a considerable distance, both from the east and the north-west, and forming an excellent leading mark to assure the navigator of his position.

Narborough thus describes Cape Quod: "It is a steep up cape, of a rocky greyish face, and of a good height before one comes to it: it shows like a great building of a castle: it points off with a race from the other mountains, so much into the channel of the streight, that it makes shutting in against the south land, and maketh an elbow in the streight."*

Abreast of Cape Quod, Capt. Stokes tried, and found the current setting to the eastward, at 1½ knot an hour.

Between Borja Bay and Cape Quod are two coves, too small to be of any use, when Borja Bay is so much superior.

Snowy Sound, a deep inlet, unimportant to the navigator, and not worth any person's while to enter, except for anchorage in a cove at about a mile, and in another at two miles, within its western head. It extends in for 10 miles, and terminates in two inlets, surrounded by high, perpendicular, black rocks. Snowy Sound was formerly considered to be a channel communicating with Whale Sound, and insulating Ulloa Peninsula; but this is disproved by Capt. Fitzroy's careful examination of it.

The following descriptions of the bays between Cape Quod and Cape Notch, are taken principally from the appendix to Cordova's Voyage to the Strait.

BARCELO BAY, the first to the west of Cape Quod, seems to be large and incommodious, and strewed with small islets.

OSORNO BAY follows, and, according to Cordova, has very deep water all over; there being 40 fathoms within a cable's length of the beach, excepting on the west side, where there is a rocky ledge, with from 10 to 20 fathoms.

Next, to the westward, is LANGARA BAY. It trends in for about a mile to the

* At not a league to the eastward of Cape Quod, is a rock which has not more than 9 feet upon it, but shows itself by the weeds growing upon it; it is a good distance from the north shore, and is in the fair way working to the westward round the Cape.

north-east, and has 10 to 12 fathoms, stony bottom. It is more sheltered than the two former bays.

POSADAS BAY is, most probably, Wallis' Lion Cove. Its western point is formed by a high, rounded, and precipitous headland, resembling, in Capt. Wallis' idea, a lion's head; and although Cordova could not discover the likeness, yet it is sufficiently descriptive to point out the bay, were the anchorage worth occupying, which is not. Wallis describes it to have deep water close to the shore; his ship was anchored in 40 fathoms.

ARCE BAY.—Cordova describes it to have anchorage in from 6 to 17 fathoms, stones. It divides at the bottom into two arms, each being half a mile deep. The outer points bear from each other W. N. W. and E. S. E., half a mile across.

FLORES BAY is, probably, Wallis' Good Luck Bay; Cordova describes it to be very small, and exposed, with from 6 to 20 fathoms, stone and gravel. At the bottom is a rivulet of very good water.

VILLENA COVE has from 15 to 20 fathoms, and is very open and exposed.

Then follows GUIRIOR BAY.—It is large, and open to the south, and probably affords good anchorage in coves. Cordova describes it to extend for more than a league to the north, the mouth being 2 miles wide. Its west point is Cape Notch, which will serve to recognize it. Near the entrance is an island and several rocks; and within them, on the west side, are 2 coves, with from 15 to 30 fathoms, stones. Beyond them is the port, which has a narrow entrance. A river falls from a considerable height into it, and by the rapidity of the current, has formed a channel of ooze in the direction of the entrance, in which there is good anchorage, in from 20 to 26 fathoms: on either side of the channel the bottom is stony. The port is too difficult to reach to make it an object of any value. Should, however, a strong gale from south or south-west oblige a ship to run in, she should avoid passing too near the west side of the narrow; for a reef extends off it for nearly a cable's length. There is also a bank outside the narrow, but it is pointed out by kelp.

From the above description of the bays between Capes Quod and Notch, occupying a space of 12½ miles, and from the view we had of them in passing, none seem to be convenient, or very safe. The best port for shelter for a ship, is Swallow Harbor, on the opposite shore: but small vessels may find many places that a ship dare not approach, where every convenience may be had; for if the water be too deep for anchorage, they may be secured to the shore at the bottom of the coves, where neither the swell nor the wind can reach them.

SWALLOW HARBOR is 1¼ mile to the westward of Snowy Sound. It is a better anchorage for ships than any in the neighborhood. The plan of it is a sufficient guide, the dangers being well buoyed, and pointed out by kelp. It was first used by Captain Carteret, in the Swallow; and Cordova gives a short description of it.

The anchorage is under the east side of the island which separates the harbor from Cordova's Condesa Bay, and which forms its west side. Wallis describes the harbor to be "sheltered from all winds, and excellent in every respect. There are two channels into it, which are both narrow, but not dangerous, as the rocks are easily discovered by the weeds that grow upon them." Cordova's account of it runs thus—"To the westward of Snowy Sound are two bays, formed in a bight by an island. The eastern, Swallow Harbor, has in its mouth three islands and a rock; besides strewed with kelp, which serves to point out the dangers in entering. Within, it is very well sheltered from all winds. The depth is from 40 to 16 fathoms, stones, and in some parts ooze. This bay is to the south of Cape Notch; and to recognize it, there is a cascade falling down the centre of a mountain at the bottom of the port, to the westward of which are 2 higher mountains; the summit of the eastern being peaked, and the western one rounded.

The bay, to the westward of the island, is Condesa Bay. It is full of islets and rocks, and the channel behind the island, communicating with Swallow Bay, is very narrow."

At about a cable's length off the western point of the entrance of Swallow Harbor, Captain Fitzroy saw a rock just awash. This danger should be carefully avoided.

STEWART'S BAY is less than a league from Swallow Bay. Of this place Capt. Stokes makes the following remarks:—"Stewart's Bay afforded us quite a resting place for the night, but it is by no means to be recommended as an anchorage; for though it is sufficiently sheltered from wind and sea, yet the rocks, in different parts of it, render the passage in or out very hazardous: every danger in it is pointed out by rock weed, but it is so much straitened as to require the utmost vigilance. A plan of it was made, and connected with the coast by bearings and angles to Cape Notch, and to other fixed points. The description of the place by Cordova cannot be improved."

The account in Cordova is as follows:—

"Stewart Bay, (La Bahia de Stuardo,) follows Condesa Bay. It has an island, besides several patches of kelp, an indication of the many rocks that exist. Even the best channel is narrow and tortuous; the depth from 12 to 16 fathoms, stones. At the bottom is an islet, forming two narrow channels leading into a port or basin, 2 cables' length wide:

the eastern channel is the deeper, and has 15 to 20 fathoms. Inside the basin, and on the east side, the depth is 6 and 9 fathoms, mud. A reef extends for half a cable's length to the westward of the south end of the islet. It would be difficult and dangerous to enter this small basin."

Then follows a deep and extensive channel, of which we know only that it extends to the south for 5 or 6 miles, and perhaps, is very similar, in its termination, to Snowy Sound. It is Sarmiento's Snowy Channel. (Ensenada de Mucha Nieve.)

At this part of the strait, the breadth is about 2½ miles; but, at Cape Quod it scarcely exceeds 1¼ mile. The shores are certainly much less verdant than to the eastward of Cape Quod; but not so dismal as Cordova's account would make them appear to be; for, he says: "As soon as Cape Quod is passed, the strait assumes the most horrible appearance, (con el aspecto mas horrible,) having high mountains on both sides, separated by ravines entirely destitute of trees, from the mid-height upwards." To us it appeared that the hills were certainly much more bare of vegetation above, but below were not deficient; the trees and shrubs, however, are of small size. For the purposes of fuel, abundance of wood is to be obtained. In the winter months the hills are covered with snow, from the summit to the base; but in the month of April, when the Adventure passed through, no snow was visible about them.

Captain Stokes remarks, that the mountains in this part, (Cape Notch,) spire up into peaks of great height, connected by singularly sharp saw-like ridges, as bare of vegetation as if they had been rendered so by the hand of art. About their bases there are generally some green patches of jungle, but upon the whole, nothing can be more sterile and repulsive than this portion of the strait. This account of Captain Stokes agrees with Cordova's; but upon examining the coves, we found them so thickly wooded with shrubs and jungle, and small trees, that it was difficult to penetrate beyond a few yards from the beach.

CAPE NOTCH is a projecting point of grey colored rock, about 650 feet high, having a deep cleft in its summit. It is a conspicuous headland, and cannot be mistaken.

The next place to the westward of Cape Notch, that can be recommended for an anchorage, is Playa Parda Cove, which is well sheltered, and, for chain cables, has a good bottom, being of sandy mud, strewed with stones; it is half a mile wide at the entrance, and about a quarter deep. Round the west side of Middle-point is a channel, a quarter of a mile long and 150 yards wide, with 6 and 7 fathoms water, communicating with a very excellent little harbor for a small vessel, of about a quarter of a mile in diameter.

Playa Parda Cove is easily known by Shelter Island, that fronts the inlet of Playa Parda. The inlet is 1½ mile long, and half a mile broad, but with very deep water all over. By luffing round the island, a ship will fetch the anchorage in the cove; and, although sail should not be reduced too soon, yet the squalls, if the weather be bad, blow down the inlet of Playa Parda with great violence. Anchor a little within, and half way between the points of entrance, at about 1½ cable from the middle point, in 5½ and 6 fathoms.

Of Glacier Bay, remarkable for a glacier at the bottom, and of another bay to the eastward of it, we know nothing: the former may possess good shelter, and, perhaps, anchorage; but the latter is too full of islands to be recommended. Between Glacier Bay and Playa Parda, the shore is bold but straight, excepting a small cove about 2 miles from Playa Parda, which seemed likely to afford shelter for small vessels. Off the west inner point is a reef, but within it there seemed to be a basin half a mile deep. Eye sketches of these three indentations were made as we passed by.

To the westward of Snowy Channel are several inlets affording, apparently, good shelter, but those we examined were found to have very deep water.

Opposite Playa Parda is a deep opening which has more the appearance of a channel leading through the Tierra del Fuego, than any opening to the west of the Barbara. It is evidently the inlet noticed by Sarmiento, and thus described by him:—"a great bay, (Ensenada,) which trends into the land in a W. S. W. direction for more than 2 leagues, and has an island at its mouth;—we called it the Abra, (opening,) because we did not see its termination. On the opposite shore there is another port and grey beach, (Puerto y Playa Parda,) which has an island that shelters it. Within the Abra the land is low and hummocky: half a league beyond, (i. e. to the eastward of) the Abra, is a cove; and on the opposite shore, a league across, is another cove, which forms a port, which the Indians call Pelepelgua, and the cove they call Exeaquil." The cove Pelepelgua, may probably be Glacier Bay, and Exeaquil must, of course, be one of the coves to the eastward of the Abra.

To us, the opening, or Abra, seemed to be one mile and a half wide, with an island in the entrance. Within, it appeared to take, first, a south, then a S. W. course, and afterwards to trend round a projecting, low, hummocky point of the east shore, and wind under the base of a high precipitous ridge on the opposite, or west shore, towards the S. E., beyond which its course could not be observed.

On the seaward coast there is a deep opening behind Otway Bay, which, probably, may communicate with it.

The weather here is generally so thick, that, although the distance across be only two to three miles, yet one shore is frequently concealed from the other, by the mist; on which account Captain Stokes found it impossible to form any plan of this part of the strait, on his passage through it. Captain Stokes, in leaving Stewart's Bay, says, "we continued our progress to the westward, having westerly and S. W. winds, with thick weather and drizzling rain. The coasts on both sides were very rarely visible to us, by reason of the thick mist by which they were capped. It is, however, a bold coast on each side, otherwise the strait would be utterly unnavigable in such weather."

MARIAN'S COVE, one mile and a half to the west of Playa Parda, is a convenient anchorage; at the entrance it is about one-third of a mile wide, and more than half a mile deep; a plan was made of it, which will be a sufficient guide. Captain Stokes observes, that it affords shelter from the prevailing winds; the anchorage is 22 fathoms, good holding ground; but less water may be obtained, if required, there being 8 fathoms within sixty yards of the beach, at the bottom of the bay. In entering, the west side should be kept aboard.

This cove is about midway between Cape l'Etoile and Playa Parda; and is a very advantageous place to stop at.

Opposite to Cape l'Etoile, is a bay with anchorage in 17 fathoms, in a well sheltered situation. From Cape l'Etoile to the entrance of the gulf of Xaultegua, the shore is strait and precipitous, and the hills are barren and rocky. On the opposite shore there are a few inlets, but the most useful one for the navigator is Half Port Bay, rather more than a league to the east of Cape Monday. It is immediately round the south side of a deep inlet. It is merely a slight indentation of the coast.

The Beagle anchored here on two or three occasions, and found it to be an excellent stopping place; the anchorage is within two-thirds of a cable's length of the west point, in 16 fathoms, muddy bottom. The situation of this cove was ascertained by observation to be in lat. 53° 11′ 36″, and long. 73° 14′ 57″ W., (or 2° 20′ 56″ west of Port Famine.) There is a plan of this bay.

"The land on the S. W. side of the anchorage is high, and thickly wooded from its summit to the water's edge. On the eastern side it is lower, the vegetation more scanty, and the trees crooked and stunted, and pressed down to the N. E. by the prevailing winds. S. W. by W. from the anchorage, is a remarkable cleft in the summit of the highland, from which a narrow stripe cleared of jungle descends to the water's edge, apparently formed by the descent of a torrent, or of large masses of the rock.* The anchorage is well sheltered from prevailing breezes, and the holding ground is good: water and fuel are abundant."—Stokes' MSS.

There is an anchorage under Cape Monday for small vessels, in which Byron anchored, and rode out a heavy gale of wind. With the exception of a shoal in midway of the entrance, on which there are 4 fathoms, it seems to offer a good shelter from the prevailing winds. On the west side of Cape Monday is Cordova's Medal Bay, (Puerto de la Medalla,) of which a very full but florid description is given in the appendix of that voyage.

It has, according to the description, an island in the entrance, which forms 2 channels, the easternmost of which is only deep enough for boats, but the western is 25 fathoms wide; it is strewed half way across with kelp; but between the kelp and the island is a good and clear passage, with 6 fathoms, sandy bottom. In the kelp there are not less than 4 fathoms, and inside it the depth is 9, 8, and 7 fathoms, sandy bottom. To enter this port, there are no dangers that are not visible, and those are easily avoided; they consist only of the islet in its entrance, and some patches of kelp, over which, however, there is plenty of water.

The Gulf of Xaultegua, improperly called Bulkeley's Channel, is a deep opening, trending into the land in an easterly direction for 28 miles, and approaching within two miles of some of the inlets on the north-west side of Indian Sound. The entrance is about four miles across, but afterwards expands to a width of nearly 15 miles. At the entrance is St. Ann's Island, between which and the south point, is a navigable channel, half a mile wide. St. Ann's Island is about two miles long, and extends in a W. N. W. and E. S. E. direction; off its N. W. end is an islet, and there is another close to its S. W. extremity.

The land forming the north side of the strait, between the Gulf of Xaultegua † and the Jerome Channel, is called Croker Peninsula.

The plan that was made of the gulf is little more than a sketch. Captain Fitz Roy, who passed through it in a boat, and examined it to its termination, says: "if ever an

* More probably by the effect of a gust of wind, which, to the eastward, particularly in the Gabriel Channel, is very common.

† The name Xaultegua is from Sarmiento, who very correctly describes it.

accurate survey be made of the gulf, it must be when all other gulfs in the world have been examined, for it is utterly useless; and from the appearance of its shores I do not think there is any anchorage in it. Therefore, should a ship be so unfortunate as to make a mistake and get into it, she must keep under way until she gets out again. There is no *thoroughfare*."—Fitz Roy's Journal.

Little has been said of the tides in this part of the strait, and, indeed, as to their rise and fall, they are really of no importance, being little more than 4 feet. It is high water at full and change in all parts within a few minutes of noon. The current sets constantly to the eastward with more or less strength.

Between Capes Notch and Quod, the current set us two miles to the eastward in 3½ hours; and from Cape Quod to Port Gallant, we found the current had favored us 6 miles in 3½ hours. The ebb tide sets to the eastward.

Strait of Magalhaens—Sea Reach, including Capes Victory and Pillar, and the Evangelists.

Between Elizabeth Island and the western end of Long Reach, there is very little swell. In a heavy gale, or, perhaps, even a strong breeze, a short sea may be experienced in the wider part of the strait, particularly near, and to the westward of Cape Froward; but nothing to be compared to the confused, breaking swell, that runs in the sea, or Western Reach. It was felt by the Beagle when beating to the westward, immediately on reaching Cape Providence. There seems to be no danger for vessels beating through the strait hereabouts, the shore being bold to. Byron passed a night, and a very tempestuous one, here; as did also the Beagle, the latter not being able to find anchorage before night. Captain Stokes, upon this occasion, writes :—" We continued beating to windward, the wind squally and weather rainy. The coast on both sides is bold. Our boards were directed during the night, which was very dark, by the sight of Cape Upright when on one shore, and of Cape Providence when on the other. We commonly tacked at the distance of a mile from either shore."

A league to the westward of Cape Monday is an inlet, which we supposed to be Sarmiento's Puerto Angosto. Upon its west head is a conspicuous round mount, and to the north, between the mount and a projecting point, is a confined but very snug and commodious cove for a small vessel, in 17 fathoms, a quarter of a mile within the head.

In consulting the appendix to Cordova's voyage, it would seem that this projection is an island, insulated by the inlet here, called Puerto Angosto. The description runs thus :—" A bay formed in the Tierra del Fuego, between Cape San Ildefonso, (Upright,) and an island in the eastern part of its mouth. The figure of the island is triangular, and its N. E. point lies in the line of bearing of Capes Lunes, (Monday,) and San Ildefonso, (Upright.) At the east end of the island is an inlet running to the south-west, 1½ mile wide, and a league long, to the bottom of the bay; the S. E. side of the island being 1½ mile long. To the westward, the distance between the shore and the island is much more, and the direction of the second channel is N. ¼ W. The bay, whose greatest breadth is two leagues, has at its bottom, and towards the S. E. part, the mouth of an inlet, the course of which disappears behind the mountains, in a S. ¼ E. direction. There appeared to be a good anchorage between the island and the eastern shore, but we had no bottom with 30 fathoms."

There seems to be no doubt that the island above described is the projecting point 4 miles to the west of Cape Monday, and that Sarmiento's Puerto Angosto insulates it; but the Spanish chart is so vague, and our own so imperfect in its part, that I prefer leaving it to future examination, rather than invent an island; although, from the Spanish account, there seems no reason to doubt its existence.

Of Upright Bay we know little. The Adelaide rode out a gale from the eastward with her stern in the surf of the beach, and the Beagle anchored under the east side of the cape, at about half a mile S. W. of the rocky islet, and for shelter from westerly winds, found it to be very good. Of this Captain Stokes says:—" We anchored at a cable's length off a small patch of light-colored shingle beach, situated at the west side of the bay, in 22 fathoms, sandy bottom. The anchorage, though affording excellent shelter from the prevailing winds, is bad with a southerly one; for the steepness of the bottom requiring a vessel to anchor close to the shore, sufficient scope is not left for veering cable. There is a plan of the bay in Hawkesworth from Byron's account, who anchored in the southern part of the bay, perhaps under the lee of the islands to the S. E. of the cape."

CAPE UPRIGHT bears due south 5 miles from Cape Providence. It has a rocky islet a quarter of a mile off its east extremity, surrounded by kelp, which also extends for some distance from the cape towards the islet, at the end of which there are 7 fathoms.*

* Mr. Simpson notices a reef about 3 leagues to the west of Cape Upright, and at some distance from the shore; we did not observe it.

CAPE PROVIDENCE is a rugged rocky mountain, higher than the adjacent coast; it is deeply cleft at the top, and, when bearing about north, the western portion of its summit appears arched, the eastern lower and peaked. When the cape bears E. by S., mag., distant about 1½ league, a little round rocky islet will be seen open of it, about one quarter of a point of the compass more southerly."—Stokes' MSS.

There are some anchorages on the right, to the N. E. of Cape Providence, according to a plan given in Hawkesworth's Collection of Voyages, but they are too much out of the way, as well as very open and exposed to southerly winds, to be of use, or to offer any security to vessels bound through the strait.

The distance from Cape Providence to Cape Tamar, is 9½ miles; in this space the land arches inwards, and forms a bay about a league and a half deep. Captain Stokes describes the coast to the east of Cape Tamar to be formed into two large bights by the land of Cape Providence. On the western side of the latter are several islands, of which two are conspicuous; they are round and of good height, and well wooded; at a distance their form is conical, the eastern being the lowest. Between them is a passage to two good anchorages, which Lieutenant Skyring, who examined them, considered even more sheltered than Tamar Harbor.

Four miles to the eastward of Cape Tamar is Round Island, to the N. W. of which is a well sheltered anchorage, but with deep water. In standing in, pass midway between Round Island and an island to the westward, which lies close to the shore, and haul round the latter to the mouth of a cove, in the entrance of which, near the south shore, there are 23 fathoms, sand. The shore to the N. and N. E. of Round Island, is very rocky. On the east side of the promontory of Cape Tamar, is the useful and excellent anchorage of Tamar Harbor. It is scarcely 2 miles wide, and rather more than half a mile deep. Its entrance is not exactly free from danger, but with attention to the following directions, none need be apprehended. There is a sunken rock between a group of rocky islets, one-third over on the western side, and a patch of kelp, one-third towards the eastern side of the bay. With a westerly wind it would be advisable to give the outer rock a berth of 2 cables' length to avoid this danger, on which there are only 9 feet of water, and upon which the Beagle struck.

"An excellent leading-mark for this shoal, is a whitened portion of bare rock, looking like a tombstone, about one-third of the way up the green side of the mountainous land that forms the coast of the bay. This stone bears N. 76° W., (by compass,) from the rocks to be rounded on entering the anchorage."

The least water found among the kelp on the east side of the channel was 4½ fathoms, and near and within the edge towards the rocky islets, there are 7 fathoms; so that with the lead in hand, and a lookout for kelp, which should not unnecessarily be entered, there is no real danger to be apprehended. The Beagle anchored at about one-third of a mile from the back of the bay. The plan will show what is further necessary to be known of the anchorage.

High water at full and change takes place in Tamar Harbor at 3h. 5m., and the perpendicular rise and fall is 5 feet.

The flood tide on this part of the northern shore of the strait sets to the eastward, and rarely exceeds half a mile an hour. At this part the strait is 7 miles wide; at Cape Phillip, to the westward, the breadth increases to 5 leagues; but at Cape Parker it narrows again 4 leagues, which breadth it keeps to the end.

To the westward of Cape Tamar is Tamar Island. It is high, and is separated from the land of the cape by a deep channel from half to one mile wide. Half a mile off its S. W. end is a rock.

Between Capes Tamar and Phillip, a space of 4 leagues, there is a deep bight, with two openings; the easternmost, in which are Glacier and Icy Sounds, extends to the N. E. for 10 miles from the mouth, and the westernmost is the commencement of Smyth's Channel. The rocks, called the Stragglers, extend to a considerable distance to the S. W. as far as 3 miles within the line of bearing between Cape Phillip and Tamar Island.

Under the lee, (the N. E.) of Cape Phillip is Sholl's Bay, in which the Beagle anchored in 1827. Of this place Captain Stokes writes:—"We found there an excellent anchorage in 15 fathoms. It is valuable for vessels working through the strait to the westward, inasmuch as, from the discontinuous nature of the northern shore, (which here is formed into deep bays,) this place will be much more easily recognized than the anchorages on the opposite coast; besides the winds hang here, in general, somewhat to the northward of west, hence a better starting-place for the westward is obtained. Here, as in every anchorage on the strait, water and fuel are easily procured; but nothing more, unless we except the wild berries, (Berberis, sp.) celery, muscles, and limpets; the wild goose abounds here, but its nauseous, filthy taste renders it uneatable. No inhabitants, no quadrupeds."

Of the coast of the strait on the south side, between Cape Upright and Valentine Bay, we know very little; there are several deep bights and spacious harbors, which may contain anchorage, but, in general, they are not found in the large harbors, which are most-

ly deep, precipitous chasms or ravines in the rock. The smaller coves, or where the land shelves down to the sea, are more likely to afford anchorages.

In the appendix to Cordova's work are descriptions of some anchorages, which it may be useful to mention here: it says. "In rounding Cape (Ildefonso) Upright we found ourselves in a bay, not very deep, 2 miles across, divided in its centre by many islets and rocks extending to the north; the outer or northernmost of which bears W. from the extremity of the cape. One mile N. W. ¼ N. from the northernmost islet is a round rock, which is of dangerous approach."

To the westward of this bay is another, 3 miles wide, and about as deep; the whole of it, particularly towards the eastern part, is full of islets, and at the bottom is a narrow canal trending to the S. S. E. At the western end of this bay, called by Wallis the Bay of Islands, from the number it contained, commences a third, which, with the two preceding, make the great bay, called by the Indians, according to Sarmiento, Alquilqua. It is contained between Cape Upright and a bold projecting point, 10 miles to the W. N. W., called Point Echenique. The country is there described to be poor, and the vegetation scanty.

The eastern point of the Third Bay has a string of islets extending a mile to the north; and to the south-west are several others. And on its east side is a bay called Cuaviguilgua; and a little beyond it, at the bottom of the bay, is Port Uriarte, the mouth of which is 2 cables' length across.

PORT URIARTE was carefully sounded, but the bottom is generally bad and stony, with 5, 8, 14, to 18 fathoms. The harbor is surrounded by high mountains, rising vertically, and with only a few stunted trees on the shores. Its greatest extent, which is from north to south, is half a mile; the mouth is not visible until close to it; its bearing from Cape Providence is S. 42° 30′ W. There is no danger in entering it but what is visible: but it is not recommended as a good harbor, from the foul gound all over it. A little to the eastward also, of Point Echenique, is Cape Santa Casilda—a low point.

To the west of Point Echenique is a harbor 2⅓ miles wide, the points of entrance being N. W. and S. E. There is an island in the centre forming two channels, but with very deep water, no ground being found with 55 fathoms. At the bottom is a canal trending to the S. S. W. and disappearing between the mountains. On the eastern side of the island the channel is at first a mile wide, but afterwards narrows gradually; the western channel is scarcely two cables' length across. The shores are high precipitous mountains. The Indians, according to Sarmiento, call the place Puchachailgua.

THE CANAL DE LA TEMPESTAD, (or Stormy Channel,) from the description, is not to be recommended. The water is very deep all over, and the place affords no security for vessels of any description. To the westward is a better harbor, which the Spanish officers thought to be Sarmiento's Port Santa Monica. It bears S. S. W. from Cape Tamar, and it is 14 miles to the westward of Cape Upright, but not more than 3 leagues, according to Sarmiento's account.

Two-thirds of a mile to the westward, is a point with two islets off it, round which is Port Churruca, a deep and spacious bay, two miles wide, the points bearing E. S. E. and W. N. W., containing two ports and some coves, but with very deep water, and therefore useless, for it would be necessary to make fast to the rocks to secure a vessel.

To the westward of this we have laid down a useful cove, Darby Cove, in which small vessels may obtain good shelter.

From Darby Cove the coast extends to the N. 65° W., for 7 miles, having in the interval several indentations, but all with deep water; at Point Felix the land trends deeply in to the south-west, and forms a bay 5 wiles wide and 2½ deep. At its western side is Valentine Harbor, in which the Beagle anchored, of which there is no written description in Captain Stokes' Journal; the plan, however, will show the nature of the anchorage, which seems to be commodious and secure, and of easy approach. On hauling round the island, there are some islets half a mile off, which must be avoided, but otherwise there seems to be no dangers.

The anchorage, as a stopping place, is in from 20 to 26 fathoms, sand, at nearly a quarter of a mile from either shore. A more sheltered situation may be obtained to the south-west.

The latitude of the mount, (marked in the plan,) is 52° 55′ 5″, and long. 74° 15′. Variation of the compass 24° 10′.

CAPE CUEVAS, the extremity of an island that is close to the shore, is in latitude 52° 53′ 19″, and long. 74° 17′ 30″. Between it and Cape Valentine the coast forms a bay with islands in it. To the westward, also, of the cape, the coast is broken, and forms some sinuosities. A league N. W. ½ W. from Cape Cuevas, is the east part of Truxillo Bay, which was not examined.

The Spanish account describes it to be 1¾ mile wide, in the direction of N. W. and S. E., and half a mile deep. At the bottom there is a port with an entrance half a mile across, bearing nearly N. and S. It is a well sheltered port, trending W. S. W. for 1¼ mile, with two small basins at the bottom. The depth is very great, but close to the

west shore there are 8, 10, to 13 fathoms, on sand and coral. Near the mouth the depth is great, and generally of stones. There are several banks buoyed by sea weed, but in none was there less than 7 fathoms water.

There is plenty of wood and water in Truxillo Bay, but nobody will visit it in preference to Tuesday Bay, or, rather, the more convenient anchorage of Tuesday Cove, situated three-quarters of a mile south of Cape Cortado. The anchorage is in 12 to 14 fathoms. Tuesday Bay is larger, and therefore more exposed to the squalls, but for a ship perhaps might be more convenient.

On the north shore of the strait, opposite to Cape Cortado, is Cape Parker, a remarkable projection, with three hummocks on the summit of the high land which rises over it. To the eastward the coast trends deeply in to the north, forming a bay, the eastern head of which, Cape Phillip, bears S. 97° E., 9 miles. There appeared to be several islands in the bay, and at the bottom a narrow opening, perhaps a channel, leading to the north.

On the west side of the bay the coast is indented and affords some anchorages, but the approach is not clear. The first bay, however, to the eastward of the S. E. trend of the cape, seems to afford a good stopping place; but it is fronted by a considerable shoal, with two rocky islets. The depth is from 7 to 22 fathoms.

The land of Cape Parker will probably turn out to be an island. To the westward of it commences a range of islands, rocks, and shoals, fronting a broken coast that should never be approached but for the purpose of discovery or seal fishery. The easternmost island is Westminster Hall, a high rocky island, and there are two or three other conspicuous points, such as the Cupola and Observation Mount, that might be noticed. The Beagle ran in amongst the breakers, and anchored near the latter, for the purpose of ascertaining its position, and obtaining bearings for the survey.

SIR JOHN NARBOROUGH'S ISLANDS consist of 8 or 10 principal islands, and perhaps, hundreds of smaller ones. Behind them there seemed to be a channel, and amongst them are several anchorages, but none to be recommended, especially when on the south coast there are two or three much better, much safer, and of much easier access.

It is a dangerous coast, as well from the immense number of rocks upon which the sea breaches very high, as from the tides, which, near the edge of the line of shoals, set frequently in amongst them.

A league to the westward of Cape Cortado, is SKYRING HARBOR. Its entrance is one mile and a quarter wide, and afterwards half a mile, and trends to the S. W. by W., for one mile and a half, and then terminates in a cove extending half a mile to the S. E., with 10 fathoms in it. There are some islands in it, and anchorage might be obtained in 27 fathoms.

At 3½ miles from the west point of Skyring Harbor is the east head of the HARBOR OF MERCY, (Puerto de la Misericordia of Sarmiento, Separation Harbor of Wallis and Carteret,) one of the best anchorages of the western part of the strait, and being only 4 miles within Cape Pillar, is very conveniently placed for a ship to anchor at to await a favorable opportunity for leaving the strait. The plan will be a sufficient guide; for there is no danger in entering. The depth is moderate, 12 to 14 fathoms, and the holding ground excellent, being a black clay. A ship may select her position; but the one off the first bight round the point being equally well sheltered, and much more convenient for many purposes, is the best berth.

The observations for latitude and longitude were made upon the largest of Observation Islets, the summit of which was found to be in lat. 52° 44′ 57″, and long. 74° 35′ 31″. The variation is 23° 48′.

Three miles to the westward of the largest Observation Islet, is Cape Pillar, upon which Captain Stokes landed, on the 25th of February, 1827, but not without considerable difficulty, owing to the great swell that then, and indeed always, prevails near it. Here he observed the latitude. Captain Fitz Roy also landed in a cove under the cape, in 1829, with his instruments, to obtain bearings from its summit; but the difficulty of the ascent was so great that he did not risk the destruction of them.

The extremity of Cape Pillar is in lat. 52° 42′ 53″, and long. 74° 39′ 31″, and Cape Victory in 52° 16′ 10″, and 74° 50′ 55″. These points form the western entrance of the strait.

"THE EVANGELISTS, as they were named by the early Spanish navigators, but the Isles of Direction by Narborough, from their forming a capital leading mark for the western mouth of the strait, are a group of rocky islets, consisting of four principal ones, and some detached rocks and breakers. The islands are very rugged and barren, and suited only to afford a resting place or breeding haunt of seals and oceanic birds. There is landing on one of the islands, and anchorage round them, if necessary. The largest and highest may be seen, in tolerably clear weather, from a brig's deck, at the distance of 7 or 8 leagues.* The southernmost, from its shape, called the Sugar-loaf, is in lat. 52°

* We saw them 22 miles off, from the Adventure's deck.—[P. P. K.]

24′ 18″, and long. 75° 02′ 56″. From the Sugar-loaf the extremity of Cape Pillar bears N. 38° W., 23½ miles, and from Cape Victory, according to Captain Stokes' survey, S. 42° W., 11 miles."—[Stokes' MSS.]

The tides here are very variable, and sometimes set to the E. N. E., towards the rocks that front Cape Victory and Sir John Narborough's Islands.

Of the Sea, or Outer Coast of Tierra del Fuego, from Cape Pillar to Cape Diego, in Strait Le Maire, by Captain Robert Fitz Roy, R. N.

[In this section, references, (printed in Italics,) are made to a work published by Captain Fitz Roy, entitled "Views of the Coast, taken on board his Majesty's surveying vessel, Beagle, 1829 and 1830."]

The western entrance to the Strait of Magalhaens is easily known by the wide opening between Sir John Narborough's Islands and Cape Pillar. The Evangelists show themselves distinctly at 6 miles distance. They are four barren rocks, about 100 feet above the sea.

On the north side of the strait, near Cape Victory, is a remarkable height, called Diana's Peak.

WESTMINSTER HALL is remarkable, but the land about Cape Pillar cannot be mistaken, after a glance at the chart.

In making the land and approaching the strait, a ship should keep well to the northward of Cape Pillar, and should, indeed, close the Evangelists, unless the wind has southing, because there is a strong current which sets across the entrance of the strait, directly towards the dangerous cluster of rocks called the Apostles and Judges. It follows the trend of the coast, and would set a ship many miles to the southward of Cape Pillar if she stood in for it without making proper allowance. It runs from 1 to 2 miles an hour, according to the winds that are or have been prevalent.

When fairly within the strait, a ship should close the southern shore. If intending to anchor, the first anchorage is the Harbor of Mercy, 4 miles from Cape Pillar. Its place is shown by five small islands, round which you pass and haul in to the anchorage.

Close to Cape Pillar are two small rocks, called the Launches. They are not more than 3 cables' length from the shore.

The cape and the shore on each side are steep to. Off the cape, at 2 miles distance, are 60 and 70 fathoms, fine sand.

Proceeding along the outer, or south-west coast, the Apostle and Judge Rocks show themselves. They are some feet, from 5 to 50, above the water, but many breakers show near them, and indicate an extensive reef. The outer rock is 4 miles from the land. Eleven miles from Cape Pillar is Dislocation Harbor, a place of refuge for an embayed or distressed ship, but unfit for any other purpose. Its entrance is rendered difficult, to the eye, by rocks, on which the sea breaks violently, and by two rocks under water, on which the sea does not always break, but whose place is accurately shown in the plan of the harbor. The place of Dislocation Harbor is pointed out by the heights, called Law and Shoulder Peaks. They are the most remarkable on that part of the coast, and immediately over the harbor.

To find the entrance, steer for the peaks; look out for the weather and lee rocks, both several feet above water, the sea breaking violently on them, and when within 4 miles of the shore you will distinctly see the opening from the mast-head. In going in, avoid the two rocks at the entrance, and anchor in the innermost part. Only a small ship can get out again without a fair wind. The prevailing winds send in a swell, but the place is quite secure. Water may be obtained very easily. The boats can lie in a stream which runs from the mountains, and fill alongside. Wood is plentiful. Four small vessels may lie in security. The bottom is very even, from 15 to 25 fathoms, fine white sand.

The entrance is narrow, exposed to the prevailing wind and swell, which might, for days together, prevent a vessel from getting out to sea. Two miles from Dislocation Harbor is Cape Deseado, the highest land hereabout, and remarkable. A rocky islet lies one mile off shore.

From Cape Deseado the coast runs high and unbroken for about two miles, then there is an opening, not examined.

Several islands succeed for a space of two miles, after which you open Barrister Bay, an exposed place, full of islets, rocks, and breakers, and unfit for any vessel.

CAPE SUNDAY is the next headland. It is high and prominent. (*See No.* 7.) Two islets and two dangerous rocks lie off it; they are shown in the chart.

This cape is one of the cluster called the Week Islands. At their south side is a roadstead, with good holding in 18 or 20 fathoms, coarse gravel and sand, with patches of rock. It is exposed to southerly winds and to those from the west; therefore, I should not advise a vessel to anchor there. Between the islands is a snug berth for a small vessel, quite secure, but difficult of access. The Beagle lay at anchor there one week, in 24 fathoms, good holding ground.

The eye must be the chief guide in entering most of these places. They are of one

description—inlets between high land, having, generally, deep water, with kelp buoying the rocky places. Flaws of wind and violent gusts off the high land render the approach to them difficult, and, to a large ship, impracticable.

There are, however, anchorages on this coast fit for a fleet, which will be mentioned in their order.

Six miles south of the Week Islands are the Landfall Islands, (*Nos.* 9, 10, *and* 11,) so named by Capt. Cook, from seeing them first when he visited this coast.

CAPE INMAN is a very remarkable headland at their western extremity. (*See Nos.* 7, 8, *and* 9.)

Behind the island, of which it forms the most conspicuous part, is LATITUDE BAY, an anchorage decidedly good, though somewhat exposed to a swell thrown in by heavy N. W. winds.

The Beagle rode out a heavy gale from that quarter, though having anchored too far in, she was exposed to rollers. The plan shows the best anchorage, (*and the sketch annexed how to find it; see No.* 11.)

Between the islands is a snug berth for a vessel not drawing more than 12 feet, in perfect security, smooth water; and a vessel should not moor in less than 10 fathoms, as close to the west shore as possible, with an anchor to the eastward, in the event of a wind blowing from that quarter. Water and wood are plentiful, as is the case in every Fuegian harbor.

Behind, or to the eastward of the Landfall Islands, is OTWAY BAY, an extensive space of water, surrounded by broken land, islets, and rocks. Many of the latter are scattered about, and render it unfit for any vessel. It is probable that passages lead hence to the Straits of Magalhaens, as deep inlets run in that direction as far as the eye can reach, from the Landfall Islands. They were not explored for want of time.*

Off CAPE INMAN are several detached rocks, on which the sea breaks violently, and gives them a formidable appearance. The outermost one is not two miles from the shore, and shows itself plainly.

CAPE SCHETKY is a remarkable double-peaked height, at the south extremity of the Landfall Islands. Some rocks just awash lie off it, distant one mile. The true course along shore, after giving the Apostles a proper berth, is S. 29° E., as far as the latitude of Cape Tate, (*No.* 12,) the southern limit of Otway Bay.

Off CAPE TATE, which is rather high, and rounded at the summit, are several clusters of rocks, called the College Rocks. They are only seen when near the land.

THE FINCHAM ISLANDS next are noticed in passing along shore. There are many islets and rocks near, and very many scattered between the islands and Cape Tate. As a reference to the chart will show, there is no good anchorage hereabout. The coast is very dangerous, and unfit to be approached. The Beagle tried to anchor in Deep-water Sound, but failing to find a proper depth of water, was obliged to drop her anchor upon the shelving end of a small island, being too far up the sound to get out again before dark.

Between the Fincham Islands and Cape Gloucester is BREAKER BAY, a large wild place, full of rocks and breakers, and exposed to all the strength of the west winds. I had neither time nor inclination to examine it, for I never saw a place more unfit for the approach of a vessel. The surrounding coast is broken into islands, islets, and rocks, almost innumerable.

CAPE GLOUCESTER is a very remarkable promontory, and cannot be mistaken. (*See Nos.* 13, 14, 15, 16, *and* 17.) At a distance it appears to be a high detached island; but on a nearer approach, a low neck of land is seen, which connects it with the largest of the Grafton Islands. (*No.* 18.) A rock (on which the sea breaks) lies nearly one mile to the N. W. There is no other danger. The cape may be passed quite close, being steep to.

Cape Gloucester is a guide to EUSTON BAY, (*Nos.* 19, 20, *and* 21,) one of the best anchorages on this coast, one which can be approached and left with any wind, without risk, and in which a fleet may lie in perfect security from all but the S. E. winds, the least prevalent of any on this coast.

THE GRAFTON ISLANDS extend about 20 miles in a S. E. direction from Cape Gloucester. Between them are several anchorages, but the best and easiest of access is Euston Bay.

Passing Cape Gloucester, you see a high island to the S. E., distant 7 miles. This is Ipswich Island. (*Nos.* 19 *and* 20.) Between it and Cape Gloucester is a bay, in which are many rocks and breakers.

Rounding IPSWICH ISLAND, you must give a good berth to the rocks under water, which lie one mile from its S. E. extremity. The sea does not always break upon them, but it does generally. Their place in the chart may be depended upon.

* It seems probable that a communication may exist between this inlet and the Abra, in the strait, opposite Playa Parda.

There is no other hidden danger. After clearing these rocks, pass close to Leading Island, (*Nos.* 19 *and* 20,) and steer for the opening of Laura Basin, which you will see under a high peaked mountain. (*Nos.* 19, 20, *and* 21.) Choose your berth by the eye, if intending to anchor in the bay, or work as far up the passage to the basin as you think proper, then anchor and warp to the berth marked in the plan.

The Beagle worked up all the way against a fresh wind blowing directly out. There is water for a frigate in the basin, but it is better suited to a small vessel. Large ships should anchor in the bay; and as the bottom is even and good, and the bay capacious, exposed only to S. E. winds, which come on gradually and seldom blow hard, it may be considered a fit place for ships of any size, or for a squadron. Wood and water are plentiful, and easy to be obtained. The depth of water in the bay varies from 5 to 20 fathoms; the bottom generally fine speckled sand.

A large patch of kelp lies across the entrance of the harbor, but there is no danger beneath it, except for a line of battle ship, as in one spot there are 4 fathoms only. This kelp was very closely examined, and its safety satisfactorily proved.

There are other anchorages among these islands, but none fit or desirable for a ship while so near Euston Bay.

HOPE HARBOR is one of those formerly used by sealing vessels.

Under ISABELLA ISLAND is an anchorage fit for a sealing vessel, but no other. Rocks lie in the way to it, as the chart shows. The Beagle passed a night there, but not by choice.

THE GRAFTON ISLANDS are high, and the remarks on the general character of the coast are applicable to them. (*See No.* 21.) Behind them lies a passage, through which a sealing vessel has passed. To the N. E. of it is a mass of land, broken into islets and rocks.

Having passed Cape Gloucester, your attention is drawn to NOIR ISLAND, of moderate height, about 600 feet above the sea, and having a remarkable neck of land to the S. W., ended by a rock like a steeple or tower. (*See Nos.* 22, 23, *and* 24.) One mile south of this point is a sunken rock, over which the sea occasionally breaks. Two other breakers are in the bight close to the point.

There is an excellent roadstead under the east side of Noir Island. Several ships may lie there, secure from all winds between north and south by the west, over a clear sandy bottom. Wood and water plentiful, and easily obtained. There is a cove at the south part of the island, where boats would be perfectly safe in any weather, but the entrance is too narrow for vessels of any kind.

The large space between Noir Island and the Agnes Islands is extremely dangerous for shipping, being scattered with rocks, some just awash, many showing themselves several feet above, others under water. Still there is abundant room to go round the island in perfect security; therefore no ship need fear being hampered by an east wind, in the event of anchoring in Noir Roads. A rock lies in the roads, and another, a very dangerous one, 4 miles to the eastward. They are exactly laid down in the chart.

Seven miles south of Noir Island are the Tower Rocks. (*No.* 23.) They are high, quite steep to, and exactly laid down in the chart. A ship may pass close to either side of them.

Between Noir Island and Cape Schomberg, on London Island, lie many reefs, and a great number of detached out-lying rocks, which render this part of the coast extremely dangerous and unfit for vessels. No chart could guide them. They must trust to daylight and clear weather, with a good lookout, if necessary to enter or leave the Barbara Channel, which opens into this bay.

The Agnes Islands, and those in their neighborhood, do not require any description. They are so fortified by out-lying rocks, as not to be fit places for the approach of any vessel.

Northward of them is Stokes Bay, and to the eastward a number of islands, between which is the Barbara Channel.

No vessel ought to entangle herself in these labyrinths; if she does, she must sail by eye. Neither chart, direction, nor soundings, would be of much assistance, and in thick weather her situation would be most precarious.

Between Noir and Kempe Islands (*No.* 25) is the Milky Way, a space of sea, in every part of which rocks are just seen awash with, or a few feet above the water. On them the sea continually breaks.

The Beagle passed in-shore of them all, close to the Agnes, Kempe, and Fury Islands; but I should not advise any vessel to follow her track, nor is there any probability of its ever being attempted.

This part of the coast only requires to be known to be the more avoided.

At the south side of Fury Island is Fury Harbor, a bad place, unfit for any vessel. The Saxe Coburg sealing schooner was lost in it in the year 1827. There is little shelter, and very bad ground.

Between Fury and London Islands is the entrance of the Barbara and Cockburn

Channels. (*No.* 26, *b.*) Rocks show themselves in every direction; the two clusters called East and West Furies being the most remarkable. They have been much frequented by sealing vessels' boats, fur seal being numerous upon them at times.

Four remarkable mountains point out the entrance to the Barbara Channel very distinctly. The Kempe Peakes (*No.* 25) are high, and show three points. The Fury Peaks (*No.* 26 *a*, *and No.* 27) are high and divided. Mount Skyring (*No.* 26 *a*, 26 *b*, *and* 27) is high, and has a single peak. St. Paul's is similar to, and in one view, from near Fury Island, appears very like the dome of the cathedral whose name it bears.

The situation of the rocks off the channel's entrance, as laid down in the chart, is accurate; but no vessel should attempt to pass them without day-light and clear weather, so that she may sail more by a good eye to the mast-head than by any chart.

At the north side of Fury Island is a snug and perfectly safe anchorage, called North Cove. It is, however, only fit for small vessels. When there, they are in security; but it must be remembered that there is no anchorage in the channel, nor until you get into the cove, unless you close the weather shore, and find a creek, in which the anchor will hold you temporarily. At the north side of Mount Skyring is another anchorage, Tom's Harbor, fit for small vessels. The Adelaide, tender to his Majesty's sloop Adventure, anchored in it when exploring these parts.

There are soundings over all the tract of sea between Noir and London Islands, seldom exceeding 60 fathoms, and near the rocks diminishing to 20, 15, and 10.

London Island is one of a large group called the Camden Islands. At its east end is a safe anchorage, called Townshend Harbor. (*No.* 27.) The Horace Peaks (*No.* 27) point out its situation. Some rocks, on which the sea breaks violently, lie off the islands, and near the entrance of Pratt Passage. They are exactly laid down in the chart. As there are no soundings in less than 50 fathoms after passing these rocks, and getting into the passage, you must depend upon the wind lasting to carry you into or out of the harbor. The holding ground in it is excellent, and though you have tremendous squalls off the high land to the westward, there is no fear of an anchor starting. The Beagle lay here moored during the worst weather she had on the coast. A very high sea was raised outside by a violent southerly gale, but she remained in perfect security without moving an anchor.

The lee side of high land, as I have elsewhere remarked, is not the best for anchorage in this country. When good holding can be found to windward of a height, and low land lies to the windward of you, sufficient to break the sea, the anchorage is much preferable, because the wind is steady, and does not blow home to the heights. Being to leeward of them is like being on the west side of Gibraltar Rock when it blows a strong Levanter.

Between and to the northward of these islands are passages with deep water, numbers of islets and rocks, and anchorages opposite to most of the valleys, or between the islands, in which small vessels could lie securely, if necessary.

BRECKNOCK PASSAGE is wide, and clear of all danger. I should prefer entering or leaving the Barbara Channel by this way, rather than by passing the Fury Rocks.

CAPE DESOLATION, the south point of Basket Island, is a very remarkable headland; (*No.* 27,) it is rugged, with many peaks.

The next promontory which is approached in passing along the coast, is Cape Castlereagh; (*No.* 27,) it is high and remarkable. Between this and Cape Desolation, is a large space of water, called Desolate Bay, leading to Courtenay Sound, Thieves Sound, and Whale-boat Sound.

Rocks and breakers abound, and make these sounds quite unfit for shipping; no doubt small vessels might, in clear weather, traverse any of these passages, but it would always be with much risk, and should not be attempted without an adequate object. Such an object does not now, nor is it likely to exist.

Under Cape Castlereagh is an excellent anchorage, called Stewart Harbor. It is not large, but for small vessels is an exceedingly good place, being easy of access with any wind, having three openings. A vessel may anchor in the entrance, and warp in; there is no where more than 16 fathoms, generally from 6 to 12. Wood and water, as in every Fuegian harbor, are plentiful, and easily obtained.

Two rocks lie nearly in the middle, jush awash at high water. The plan shows their place exactly.

A rock, on which the sea breaks, lies one mile west of the middle opening to the harbor. There is no other danger.

Farther to the south-east are the Gilbert Islands, off which, 8 miles, S. 30° E., from Cape Castlereagh, are the Nicholson Rocks.

Between the Stewart and Gilbert Islands is Adventure Passage, an open space, with deep water, clear of danger.

At the north-eastern side of the eastern Gilbert Isle, is Doris Cove, a safe anchorage for a small vessel. The Beagle lay there, moored, one week. There are no hidden dangers hereabouts; the eye and the chart will guide a vessel safely.

I say nothing of the large sounds and numerous passages lying to the northward of these and the Stewart Islands, because they are not likely to be again visited.

The Londonderry Islands are the next, they extend nearly to Christmas Sound.

TREBLE ISLAND is a remarkable height, having three peaks; it is visible from a considerable distance; near it are some straggling rocks, shown in the chart.

Nine miles, S. 22° E., from Treble Island, are the Phillips' Rocks. They are dangerous, though above water, because so far from the shore, and so low.

COOKE BAY is a large space between Cape Alikhoolip and Waterman Island. Broken land, islets and breakers, surround and make it unfit for the approach of vessels. Its shores were explored by the Beagle's boats.

At the north-east is the entrance of the Beagle Channel, and a passage to Whale-boat Sound, both unfit for sailing vessels, excepting with a fair wind.

WATERMAN ISLAND, (*No.* 28,) is soon known by the remarkable heights at its south part. The southernmost was named by Capt. Cook, "York Minster," from its fancied resemblance to that building. He well describes it as a "wild looking rock." (*No.* 28.)

Eight miles west of "York Minster," and 5 from Point May, are the Capstan Rocks, above water about 20 feet. There are no other dangers to seaward of a line from York Minster to the Phillips' Rocks.

Hauling round York Minster, you may enter Christmas Sound. There is no hidden danger; the chart and plan are exact. Adventure Cove, (in which Captain Cook anchored,) is the easiest of access, but it will only hold one vessel.

MARCH HARBOR is large, with good holding ground, but there are many rocky places; and one rock, under water, (see the plan,) having on it only one fathom; its place is marked by very thick kelp. The Beagle worked through the narrow passage, round Shag Island, from Adventure Cove, and worked into the innermost corner of the harbor without using a warp; larger vessels would of course find themselves more confined.

I do not think a vessel of more than five hundred tons should attempt to enter Christmas Sound.

The Beagle lay moored in this harbor all the month of March, in perfect safety: but her chain cables became entangled with the rocks, and were not hove in without much difficulty and delay.

PORT CLERKE is a bad place for any vessel, though quite secure when in it; access is difficult, and from its situation, it is exposed to very violent squalls.

PICKERSGILL COVE, (named by Cooke,) as well as Port Clerke, is unworthy of notice as an anchorage.

Cook's description of Christmas Sound, is as accurate as his accounts of other places. His "Great Black Rock" and "Little Black Rock," show themselves as you enter. Near York Minster are several rocks and islets, close to the eastward; one rock, on which the sea breaks violently, lies 2 miles E. 20° S., from the south extreme of the Minster. You may pass it quite close. Off the "Great Black Rock," there are two or three breakers, caused by rocks under water.

But little current sets among these islands. To seaward of them, and near the headland, it sets as I before described.

The tides between Cape Pillar and Cape Horn, are regular, as regards their rise and fall, and time of high water, but not so with respect to their velocity and direction. It appeared to me that while the water was rising upon the shore, the tide, (or rather current,) set along shore from the north-west towards the south-east, at the rate of one mile an hour, or more, according to the wind.

During the six hours of falling water, or ebb tide, there was little or no current setting along shore.

At Cape Pillar it is high water at one o'clock, on the days of full and change. At York Minster it is high water at 3 in the afternoon.

At the intermediate places the time gradually changes from 1 to 3, as you go to the south-east.

Further eastward, high water is still later. At Cape Horn it is at half past 3.

The rise of tide varies from 4 to 8 feet. It is noted in each plan.

Eastward of Christmas Sound lie the Wood Islands. There is no good anchorage among them. Passages and broken land lie behind them to the northward.

Off Point Nativity are two islands and an outlying rock. Hope Island is six miles to the south-east of this point.

The Ildefonsos, a large group of rocks and islets, next claim attention. They are thirty-five miles distant from York Minster, and bear, from that spot S. 41° E. They extend five miles in a north-west and south-east direction, are very narrow, and about one hundred feet above the sea. (*See No.* 29.) They appear to be the remains of the ridge of a mountain, broken through in many places by the sea. You may pass close by them in a vessel, for there is no danger. Sealers have much frequented them for fur seals.

Neither Trefusis Bay nor Rous Sound afford anchorage.

LEADING HILL, (of Mr. Weddel,) is a very remarkable double peaked height; beyond it are Duff's Bay, Morton and Henderson Islands, and the entrance of Indian Sound (of Mr. Weddel.)

There may be good anchorage between these islands. There was not time to examine some coves on the east side of Morton Island, whose appearance promised shelter and holding ground.

CLEARBOTTOM BAY is at the north end of Morton Island, and a good anchorage. It is described in Mr. Weddel's useful and interesting journal.

INDIAN COVE, in which also he anchored, and remained some time, is not a place to be recommended to vessels. They must go far among the islands to reach it, and when there, have a bad rocky bottom, with deep water, excepting one corner, where the Jane lay at anchor with the Beaufoy. Many better anchorages may be attained on this coast, with less trouble.

INDIAN SOUND is a large tract of water, extending to the north-west. It is full of islands.

Between Cape Weddel, at the east side of Indian Sound, and False Cape Horn, (*No.* 33,) is a tract of broken land, which has not been properly examined. It is, however, a lee shore during south-west and southerly winds, and therefore unfit for anchorage.

On Henderson Island is a high sharp-pointed hill, which is visible at a great distance. From its summit the Diego Ramirez Islands (*Nos.* 30, 31, *and* 32,) were seen, though fifty miles distant. The highest point of these islands is about 150 feet above the sea. There is no hidden danger near them. They lie nearly north and south, and extend over a space of five miles.

A ship may pass between the northern cluster and that to the southward. Detached rocks lie off the southern island: all the outer ones are above water. The southern, or Boat Island, has a cove at its north-east corner, in which boats may land; there is water on the point close to the eastward of this landing place.

Their place on the chart may be depended upon, because they were seen from, and connected by triangulation to, Henderson and Hermite Islands (Kater's Peak.) There are soundings on each side, but too deep for anchorage, excepting to the south-east, where Mr. Weddel lays down some soundings (in his chart,) which were not found.

Between the Diego Ramirez and the Hermite Islands, there is no danger of any kind.

FALSE CAPE HORN is a very remarkable headland. (*No.* 33.) From the east or west it looks like a large horn. It is a leading mark to the best anchorage on this coast.

"ORANGE BAY."—To anchor in this bay you must pass to the eastward of the False Cape, as close as you please. Steering N. E., (*true*,) for four miles, will bring you abreast of Point Lort; a bay two miles wide is then opened, in which you may anchor, if necessary, in 8 or 10 fathoms, over a fine sandy bottom. Some rocks, above water, lie at the north side. Beyond the point which forms the north side of this bay, is a small cove, with 18 fathoms water in the middle; beyond it is another cove, rather larger, after which you open Schapenham Bay (so called by the Nassau Fleet.) A north course (*true*) from Point Lort will take you abreast of Orange Bay.

SCHAPENHAM BAY is one mile and a half wide; there is a small black rock, above water, rather to the northward of its middle. A great deal of kelp, lying over a rocky bottom, is seen at the head of the bay, and a large waterfall marks the place distinctly. There is anchorage in from 10 to 15 fathoms, near the south point; but I should not recommend a vessel to use it, when by going further she may get into an unexceptionable harbor, or anchor off its entrance, in perfect security.

The land behind these coves that has been mentioned, is high and rugged: two singular peaks show themselves, which resemble sentry-boxes. Near the shore the land is low, compared with other parts of the coast, and has not the iron-bound forbidding appearance of the more westerly shores.

From the heights, sudden and strong squalls blow during westerly winds. Being generally a weather shore, and regular soundings extending along it, there is no difficulty in choosing or approaching an anchorage.

Off Orange Bay, anchor soundings extend to two miles from the land. The opening of the bay is three miles wide, and in that part are eighteen or twenty fathoms, over a fine speckled sand. Two islands, the larger having a smooth down-like appearance, lie in the middle; behind them is the harbor, a square mile of excellent anchorage, without a single rock or shoal. In the two creeks at the south side, is good anchorage for small vessels: the depth of the water varies gradually, from 5 to 20 fathoms. The bottom, every where, is a fine speckled sand. The land hereabouts is low, comparatively speaking, and you are not annoyed by the violent squalls which come from the heights in other places.

You may go close to the shore in every part, therefore no directions are necessary to

point out the way to the best berth, which is marked in the plan. Wood and water are plentiful; the best watering place is in a small cove at the north side, called Water Cove. This harbor is fit for a fleet of line-of-battle ships, and could supply them with any quantity of wood and water.

Off the north point are several small islets, which must not be approached too closely; they are, however, out of the way.

Six miles N. N. W. of the outer anchorage, is a curious island, like a castle, or a pack-saddle.

Orange Bay is somewhat open to east winds, but they seldom blow strong, and would be fair for ships bound westward. No sea can be thrown in, because of the Hermite Islands.

There is no current here worthy of notice. The tide rises six feet: high water at half-past three.

Opposite to the land lying between New Years and Tekeinika Sound, called Hardy Peninsula, on the east side of which is Orange Bay, are the Hermite Islands. (*Nos.* 34, 35, *and* 36.) Their northern shores have not yet been examined. The southern are accurately laid down in the chart.

NASSAU BAY extends to the north and north-west, into the Beagle Channel.—There is nothing to lead a vessel into these openings, therefore a description of them is not necessary. They may prove useful for boats, and a glance at the chart will be of more service, for their purpose, than any directions.

Nassau Bay is very accessible, and free from dangers. Anchorage may be found on each coast, and the only dangers are some rocks, (or islets,) above water, shown in the chart, and visible at a distance by day-light. The northern shore is low, particularly towards Guanaco Point, where the coast first begins to show signs of approaching Eastern Patagonia, changing its rocky heights for level land and low earthy cliffs.

On the southernmost of the Hermite Islands, is Cape Horn. There is nothing very striking in the appearance of this promontory, as seen from a distance; but, in passing near, it is more remarkable, showing high black cliffs towards the south: it is about five hundred feet above the sea. (*The Sketches Nos.* 34, 35, *and* 36, *are faithfully drawn.*)

No dangers exist to the southward, in approaching these islands—they may be closed without hesitation.

WEST CAPE is low. The land about St. Martin's Cove is high and rugged.—Wollaston and Herschel Islands have also ridges of mountains. Kater's Peak, the highest land (excepting Mount Hyde) on the islands, is seventeen hundred feet above the sea.*

In the channel between False Cape Horn and the Hermite Islands, a current is found setting into Nassau Bay, and rather towards the Hermite Islands, at the rate of two knots an hour with the flood tide, and about half a knot with the ebb. As this current sets rather towards West Cape, a good berth must be given to it in passing.

FRANKLIN SOUND is clear of obstruction, and has no other danger than those which are shown in the chart.

In Nassau Bay the compasses are much affected; they become very sluggish, and might cause a serious error if not carefully attended to.†

A strong current sets, at times, along the outer coast of the Hermite Islands, and through the Bay of St. Francis. It varies from half a knot to two knots an hour, according to the wind and the time of tide; and, in the bay, changes its direction with the change of tide.

With the sketch or chart, no one would require a direction to point out St. Martin's Cove. Temporary anchorage may be had in the small bay leading to St. Joachim's Cove, or under the south head of St. Martin's Cove, where you find from 20 to 25 fathoms, over a clear sandy bottom. As you approach the western end of St. Martin's Cove the water

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* By barometrical measurement, 1742 feet above high water mark.—[P. P. K.]

† The magnetic needle was very remarkably affected in many parts of the islands of the group, although I did not observe any great difference, when at a distance from the rock of which they are formed, or on board the ship. On one occasion, on ascending the summit of Maxwell Island, in Port Maxwell, the compass was placed for convenience upon the rock, when the needle was found to be so much influenced by the ferruginous nature of the rock, composed of quartz, with large and numerous crystals of hornblende, that its poles became exactly reversed. An experiment was afterwards made by taking a set of bearings of a distant object, (to prevent an error of parallax,) at several stations around, at fifty yards from the above magnetic rock; when the extreme difference amounted to 127°. The block upon which the compass was placed in the first instance, is now in the museum of the Geological Society.

No sensible difference, however, was found in the valley at the bottom of St. Martin's Cove, where the variation of the compass was observed by several different instruments, and compared with astronomical bearings, when the deviation did not amount to more than the usual amount of the variation in that neighborhood.—[P. P. K.]

shoals to 15 and 10 fathoms. It is perfectly secure, but visited by very violent squalls during a westerly wind.

PORT MAXWELL is a perfectly secure anchorage, and untroubled by mountain squalls, (or willi-waws,) but it is rather out of the way. Though it has four openings, only two are fit for vessels—those to the north and east. The best berth in it has 16 fathoms water, over a clear sandy bottom. This harbor is decidedly good, though it requires a little more time and trouble in the approach.

The passages between these islands have deep water, and are free from dangers. What few rocks there are, show themselves above water, or are thickly covered with kelp. Some rocks lie off the south end of Chanticleer Island, too close to be of much consideration.

One mile to the westward of Cape Horn there are three rocks, generally above water. The sea always breaks on them.

Off the east point of Horn Island, are some small rocks and breakers. Off Cape Deceit are several rocks, all above water; and two miles to the S. E. is a cluster rising 30 or 40 feet above the sea.

Off Cape Horn the current is as strong as on any part of the coast. Between it and Cape Pillar, it is by no means regular; sometimes with a strong wind and flowing tide it runs two knots an hour—at others it is hardly worth notice.* I never found it set to the westward at any time of tide, or with any wind.

The Barnevelt Islands, (*No.* 28,) lie 11 miles N. E. by E. from Cape Deceit. The chart and sketch are a sufficient description. For the Evouts Isles, (*No.* 38,) I should refer also to the chart and the accompanying view; and for the appearance of this part of the coast, from Cape Horn to Cape Good Success, to the sketch. (*No.* 37.)

The space between Cape Deceit and New Island is free from hidden dangers, as far as I am aware, but it has not yet been sufficiently examined.

In Goeree Road there is very good anchorage in 6 or 7 fathoms water, over a sandy bottom.

LENNOX ISLAND, as well as New Island, and indeed any part of the coast hereabouts, may be approached with confidence, using the lead and looking out for kelp.

There are no shoals, but the water is not so deep as to the west of Cape Horn, neither is the land near so high.

At the east side of Lennox Island is excellent anchorage. Small vessels may go into a cove in which the Beagle lay moored, but large ships must anchor in the road, which is quite secure, and sheltered from all but south-east winds, with which of course a vessel would not wish to remain at anchor. To the north of Lennox Island is the eastern opening of the Beagle Channel. It is easy of access, but useless to a ship. Boats may profit by its straight course and smooth water. It runs 120 miles in nearly a direct line between ranges of high mountains, covered always with snow. The highest are between 3 and 4,000 feet above the sea. This channel averages 1½ mile in width, and in general has deep water; but there are in it many islets and rocks near them.

A range of high mountains runs uninterruptedly from the Barbara Channel to Strait le Maire. Mount Sarmiento, more than 5,000 feet † above the sea, is in this range. Southward of these mountains is a succession of broken land, intersected by passages, or large sounds. A boat can go from the Week Islands to the eastern entrance of the Beagle Channel, without being once exposed to the outside coast, or to the sea which is there found.

Some heights on New Island were noticed by Cook; they were not, however, so visible from the west as from the east side.

Good temporary anchorage during westerly winds may be obtained under New Island, or near the shore to the northward; but I know of no good harbor between Richmond Road and Good Success Bay, in Strait le Maire.

Regular soundings are found hereabouts, in all directions, and the shore is steep to.

Neither Aquirre Bay, Spaniard's Harbor, nor Valentyn's Bay, are fit for more than temporary anchorage during northerly or westerly winds. They are much exposed to the south. For that purpose the chart is a sufficient guide.

The tide is felt strongly on this part of the coast, causing races and eddies near the projecting points. In the offing, the current, (or tide,) sets towards Strait le Maire, from 1 to 3 knots an hour, when the water is rising on the shore, and the wind westerly. While the water is falling, it runs with less strength, and with an easterly wind is not felt at all.

The Bell Mountain is remarkable: it is seen far at sea, from the north as well as from the south. It is high, and in shape resembles a large bell.

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* In beating up to the anchorage in St. Martin's Cove, at from 20 to 60 miles to the eastward of Cape Horn, I found the current setting constantly at from half to one mile per hour, the wind throughout being south-westerly.—[P. P. K.]

† 6,800 feet.

CAPE GOOD SUCCESS is high and bluff. (*No.* 40.) Some rocks lie close to it, above water.

The land from the Bell Mountain to Good Success Bay is higher than that near Lennox and New Islands. It more resembles the south-west coast.

Between Cape Horn and Staten Island, regular soundings are found, between 30 and 70 fathoms, over a sandy bottom.

The soundings in Strait le Maire are similar near their southern entrance. Towards the north the soundings diminish; and 2 miles from Cape San Diego there are not more than 30 fathoms water, over a rocky bottom. The strait is clear of all obstacles, the tide excepted. The land from Cape Good Success to Maurice Cove, is high and bold, with water for a ship as near to it as she ought to go.

Rather more than two miles north-east of Cape Good Success is a projecting headland, which, at first, appears to be the cape. Two rocky islets show themselves close to it, and from a distance appear like a ship under sail.

Six miles from these rocks, N. E. by N., is the Bay of Good Success. (*No.* 40.) It is a good anchorage, perfectly safe, provided that a vessel does not anchor too far in towards the sandy beach at its head; for, during south-east gales, a heavy swell with dangerous rollers sets right into the bay. The best berth is shown in the plan. Heights of about 1,200 feet above the sea surround the bay; therefore, with strong winds, it is subject to squalls, which, during westerly gales, are very violent.

GOOD SUCCESS BAY is an excellent anchorage for vessels of any size to stop in to get wood or water, but it would not answer if a vessel required to lie steady for repairs, as a swell frequently sets in. It is quite safe; but in the winter season, when easterly winds are common, no vessel should anchor so near the head of the bay as she might in summer.

The "Broad Road," mentioned by Cook, is a good mark for the bay, if the inbend of the land does not sufficiently point out its situation. It is a barren strip of land on the height at the south side of the harbor. Maurice Cove has no good anchorage; it is merely a rocky bight.

Hence to Cape San Diego, the land is much lower, and the water near it less deep.

CAPE SAN DIEGO is low. A ship may go close to it. There are shoaler soundings towards the east, for about two miles, than in other parts near here; for a rocky ledge under water seems to project from the cape. On this ledge there are overfalls, strong eddies, and a violent race of tide when the wind is opposed to it.

Beyond Cape San Diego the land suddenly trends away westward.

CAPE ST. VINCENT is a rocky point, with low bluffs above it.

Between this point and Cape San Diego, is "Thetis Bay," a tolerable anchorage during west or southerly winds, though the bottom is rocky in many places. Between the heads the tides run with great strength; therefore, a ship should anchor off a green bluff at the west side, and within the line of the heads she will have from 6 to 12 fathoms of water, over a coarse sandy bottom, mixed with patches of rock.

Beyond Cape St. Vincent the land trends to the W. and N. W. It is rather low near the sea, but in shore are many hills partially covered with wood.

Regular soundings extend to seaward for many leagues; and good anchorage may be found near the land, on any part of this coast, during westerly winds.

The tides in Strait le Maire are as regular as in any part of the world. They will assist a vessel materially in her passage, if taken at the right time.

As the strait is very wide, perfectly free from obstacles of any kind, the soundings regular, with Good Success Bay close at hand, in case the wind or tide should change, vessels may pass through without difficulty or risk.

When the tide opposes the wind and swell, there is a heavy, and, for small vessels, a dangerous race of tide off Cape San Diego, where, as I said before, there is a shoal ledge, and the tide runs very strongly. We found it so in the Beagle at even a neap flood tide; but let it be remarked, that on another day, at the top of the springs, being the day after full moon, we passed the same spot at half flood, with perfectly smooth water.

Though the tide was running three or four knots an hour round the cape, and eddies were seen in every direction, the vessel's steerage was but little affected by them.

It is high water on the shore in Good Success Bay, and slack water in the strait, at 4 in the afternoon on the full and change days, and low water with slack tide in the offing, at 10 in the morning. The tide rises perpendicularly from 6 to 8 feet, according to the wind.

At Cape Pillar, as I before said, the turn of tide is about 1 o'clock. Along the S. W. and S. E. coasts, the time gradually increases to 4 in the afternoon at this place.

From Cape San Diego to the northward, the tide sets north and west along the shore, from one knot to three. The ebb sets in a contrary direction, but not so strongly.

In Strait le Maire the flood tide runs from two to four knots near the cape, and from

one to three in mid-channel, more or less, according to the strength and direction of the wind. The ebb sets to the southward, about one knot an hour.*

At times, when a strong flood tide is opposed by a northerly wind, there is an overfall off Cape San Diego, like the "Bores" on our own coast and elsewhere.

STATEN ISLAND is high, and its mountains are generally covered with snow. Its shores lying towards the strait are very bold and rugged. No danger is near them, excepting strong eddies and races, caused by the tide near the headlands.

CAPE ST. ANTONY, MIDDLE CAPE, AND CAPE SAN BARTHOLOMEW, are high, bluff promontories. The soundings to the northward are very regular, and give notice of your approach to Staten Island, or the Strait le Maire.

General Observations upon the Appearance and Character of the Sea Coast of Tierra del Fuego; Description of the Anchorages, and Remarks upon the Seasons, Wind, and Weather.

From Cape Pillar to Cape Horn, the coast of Tierra del Fuego is very irregular, and much broken; being, in fact, composed of an immense number of islands. It is generally high, bold, and free from shoals or banks; but there are many rocks nearly level with the surface of the water, distant 2, and even 3 miles from the nearest shore, which make it very unsafe for a vessel to approach nearer than 5 miles, excepting in daylight and clear weather. The coast varies in height from 8 to 1500 feet above the sea. Further in shore are ranges of mountains always covered with snow, whose height is from 2 to 4000 feet, and in one instance, (Sarmiento,) 5000.

With daylight and clear weather, a vessel may close the shore without risk, because the water is invariably deep; and no rock is found which is not so marked by sea weed, (or kelp, as it is generally called,) that by a good lookout at the mast-head, its situation is as clearly seen as if it were buoyed. By avoiding kelp you are sure of having sufficient water for the largest ships, on any part of this coast. At the same time it must be remembered that kelp grows in some places from a depth of 30 fathoms, and that on many parts of this coast you may pass through thick beds of sea weed without having less than 6 fathoms water; still it is always a sign of danger, and until the spot where it grows has been carefully sounded, it is not safe to pass over it with a ship. As an instance: after sounding a large bed of this weed in one of the Beagle's boats, and thinking it might be passed safely, a rock was found, not more than 4 feet in diameter, having only one fathom water over it.

Viewing the coast at a distance, it appears high, rugged, covered with snow, and continued, as if there were no islands. When near, you see many inlets which intersect the land in every direction, and open into large gulfs, or sounds, behind the seaward islands.

You now lose sight of the higher land, which is covered with snow throughout the year, and find the heights close to the sea thickly wooded towards the east, though barren on their western sides, owing to the prevailing winds. These heights are seldom covered with snow, because the sea winds and the rain melt it soon after it falls. Opposite to the eastern valleys, where the land is covered with wood, and water is seen falling down the ravines, good anchorage is generally found. But these valleys are exposed to tremendous squalls, which come from the heights. The best of all anchorages on this coast, is where you find good ground on the western side of high land, and are protected from the sea by low islands. It never blows near so hard against high land as from it, but the sea on the weather side is of course too formidable, unless stopped, as I mentioned, by islets.

Where the land is chiefly composed of sandstone or slate, anchorages abound; where of granite, it is difficult to strike soundings.

The difference between the granite and slate, or sandstone hills, can be distinguished by the former being very barren and rugged, and of a grey or white appearance; whereas the latter are generally covered with vegetation, are dark colored, and have smoother outlines. These slate or sandstone hills show few peaks, and the only rugged places are those exposed to wind or sea.

Soundings extend to 30 miles from the coast. Between 10 and 20 miles from the land the depth of water varies from 60 to 200 fathoms, the bottom almost every where a fine white or speckled sand. From 10 to 5 fathoms distant the average depth is 50 fathoms; it varies from 30 to 100, and in some places no ground with 200 fathoms of line. Less

* The flood tide sets through Strait le Maire from the southward, and along the north and south sides of Staten Island from east to west. It is high water, at full and change, at the anchorage within the New Year's Isles, as well as on the east side of Strait le Maire, at 5 o'clock. The current is very strong, running from 4 to 6 knots. Off Cape St. John there is a tide race, which extends for some distance off the point.—[P. P. K.]

than 5 miles from the shore the soundings are very irregular indeed, generally less than 40 fathoms, but in some places deepening suddenly to 100, or more: in others a rock rises nearly to, or above the surface of the water.

After carrying 50, 40, 30, or 20 fathoms, towards an inlet which you are desirous of entering, you will probably find the water deepen to 60 or 100 fathoms as soon as you enter the opening: and in the large sounds, behind the seaward islands, the water is considerably deeper than on the outside.

There is a bank of soundings along the whole coast, extending from 20 to 30 miles from it, which appears to have been formed by the continued action of the sea upon the shore, wearing it away and forming a bank with its sand.

Between the islands, where there is no swell or surf worth notice, the water is deep, and the bottom very irregular.

A small ship may run among the islands in many places, and find good anchorage; but she runs into a labyrinth, from which her escape may be difficult, and, in thick weather, extremely dangerous.

Fogs are extremely rare on this coast, but thick rainy weather and strong winds prevail. The sun shows himself but little; the sky, even in fine weather, being generally overcast and cloudy. A clear day is a very rare occurrence.

Gales of wind succeed each other at short intervals, and last several days. At times the weather is fine and settled for a fortnight, but those times are few.

Westerly winds prevail during the greater part of the year. The east wind blows chiefly in the winter months, and at times very hard, but it seldom blows in summer.

Winds from the eastern quarter invariably rise light, with fine weather; they increase gradually—the weather changes—and at times end in a determined heavy gale. More frequently they rise to the strength of a treble-reefed topsail breeze, then die away gradually, or shift to another quarter.

From the north the wind always begins to blow moderately, but with thick weather and more clouds than from the eastward, and it is generally accompanied by small rain. Increasing in strength, it draws to the westward gradually, and blows hardest between N. and N. W., with heavy clouds, thick weather, and much rain.

When the fury of the north-wester is expended, which varies from 12 to 50 hours, or even while it is blowing hard, the wind sometimes shifts suddenly into the S. W. quarter, blowing harder than before. This wind soon drives away the clouds, and in a few hours you have clear weather, but with heavy squalls passing occasionally.

In the S. W. quarter the wind hangs several days, (generally speaking,) blowing strong, but moderating towards its end, and granting two or three days of fine weather.

Northerly winds then begin again generally, during the summer months; but all manner of shifts and changes are experienced from north to south by the west, during that season, which would hardly deserve the name of summer, were not the days so much longer, and the weather a little warmer. Rain and wind prevail much more during the long than the short days.

It should be remembered that bad weather never comes on suddenly from the eastward, neither does a south-west or southerly gale shift suddenly to the northward. S. W. and southerly winds rise suddenly and violently, and must be well considered in choosing anchorages, and preparing for shifts of wind at sea.

The most usual weather in these latitudes is a fresh wind between a N. W. and S. W., with a cloudy overcast sky.

Much difference of opinion has prevailed as to the utility of a barometer in these latitudes. I can only say, that during 12 months constant trial of a barometer and sympiesometer, (Adie's,) I found their indications of the utmost value. Their variations do not, of course, correspond to those of middle latitudes, but they correspond to those of high northern latitudes in a remarkable manner, changing south for north, (east and west remaining the same.)

There is a continual current setting along the S. W. coast of Tierra del Fuego, from the N. W. towards the S. E., as far as the Diego Ramirez Islands. From their vicinity the current takes a more easterly direction, setting round Cape Horn towards Staten Island, and off to seaward to the E. S. E.

Much has been said of the strength of this current, some persons supposing that it is a serious obstacle in passing to the westward of Cape Horn, while others almost deny its existence.

I found it run at the average rate of a mile an hour. Its strength is greater during west—less, or insensible, during easterly winds. It is strongest near the land, particularly near the projecting capes or detached islands.

This current sets rather from the land, which diminishes the danger of approaching this part of the coast.

There is, in fact, much less risk in approaching this coast than is generally supposed. Being high and bold, without sand-banks or shoals, its position accurately determined, and a bank of soundings extending 20 or 30 miles from the shore, it cannot be much

feared. Rocks, it is true, abound near the land, but they are very near to the shore, and out of a ship's way.

A line from headland to headland (beginning from the outermost Apostle) along the coast, will clear all danger, excepting the Tower Rocks, which are high above water, and steep to.

Gales of wind from the southward, and squalls from the S. W., are preceded and foretold by heavy banks of large white clouds rising in those quarters, having hard edges, and appearing very rounded and solid. (*Cumuloni.*)

Winds from the northward and north-westward are preceded and accompanied by low flying clouds, with a thickly overcast sky, in which the clouds appear to be at a great height. The sun shows dimly through them, and has a reddish appearance. For some hours, or a day before a gale from the north or west, it is not possible to take an altitude of the sun, although he is visible; the haziness of the atmosphere in the upper regions causing his limbs to be quite indistinct. Sometimes, but very rarely, with the wind light between N. N. W. and N. N. E., you have a few days of beautiful weather. They are succeeded by gales from the southward, with much rain.

It may be as well to say a few words respecting the seasons in the neighborhood of Cape Horn, as much question has arisen respecting the propriety of making the passage round the cape in winter or in summer.

The equinoctial months are the worst in the year, generally speaking, as in most parts of the world. Heavy gales prevail at those times, though not, perhaps, exactly at the equinoxes. In August, September, October, and November, you have the worst months in the year. Westerly winds, rain, snow, hail, and cold weather then prevail.

December, January, and February are the warmest months; the days are long, and you have some fine weather: but westerly winds, very strong gales at times, with much rain, prevail throughout this season, which carries with it less of summer than in almost any part of the globe.

March, as I said, is stormy, and perhaps the worst month in the year with respect to violent winds, though not so rainy as the summer months.

In April, May, and June, the finest weather is experienced; and though the days shorten, it is more like summer than any other time of the year. Bad weather is found during these months, but not so much as at other times. Easterly winds are frequent, with fine clear settled weather. During this period there is some chance of obtaining a few successive and corresponding observations. To try to rate chronometers by equal altitudes, would be a fruitless waste of time at other seasons. June and July are much alike, but easterly gales blow more during July.

The days being so short, and the weather cold, make these months very unpleasant, though they are, perhaps, the best for a ship making a passage to the westward, as the wind is much in the eastern quarter.

I should say that the summer months, December and January, are the best for making a passage from the Pacific to the Atlantic Ocean, though that passage is so short and easy that it hardly requires a choice of time. For going to the westward, I should prefer April, May, and June.

Lightning and thunder are seldom known. Violent squalls come from the south and south-west, giving warning of their approach by masses of clouds. They are rendered more formidable by snow, and hail of large size.

South-west Coast, or Western Patagonia, from the Strait of Magalhaens to Cape Tres Montes.

Very small portions of the sea coast of this interval were seen by us. The following descriptions are principally abstracted from the manuscript journals of the late Captain Stokes, Lieutenant (now Captain) Skyring, and Mr. Kirke, mate of his Majesty's surveying sloop Beagle.

Between CAPE VICTORY AND LORD NELSON STRAIT the coast is very much broken, and intersected by channels leading between the islands of Queen Adelaide Archipelago, on the sea coast of which, to the N. N. E. of Cape Victory, is a remarkable pyramidal hill, called Diana Peak, which, in clear weather, is visible to ships entering the strait. Cape Isabel is a steep rocky promontory of great height, with a peaked summit, and a sharply serrated ridge, having two detached columnar masses of rock. Beagle Island, lying off it, is wall-sided; but although tolerably high, is much lower than the land of the cape.

CAPE SANTA LUCIA, the westernmost point of Cambridge Island, is high and precipitous. Cape George, at the south end, is lower, and forms a bluff point.

THE SAN BLAS CHANNEL, DUCK AND DUNCAN HARBORS, THE DUNCAN ROCK, and other rocks off them, are inserted from the oral information of the master of an American schooner, and, probably, are very incorrectly laid down. Augusta Island and the White Horse were seen by Lieutenant Skyring.

CAPE SANTIAGO, the south end of Madre de Dios Archipelago, is correctly

placed, as are also the general direction of the coast to the northward, and the summits of the land that are particularized, viz.: the opening of West Channel, April Peak, Tower Rock, and the bay to the north of it, and Cape Three Points, which is the south entrance of the Gulf of Trinidad. Opposite to the latter cape is Cape Primero, the south point of the mountainous Island of Mount Corso, the land of which may be seen, in clear weather, from the southward, at the distance of 10 leagues. It forms the visible northern termination of the coast line. Viewed when bearing north, or any point to the westward of north, its summit makes like a round mount rising conspicuously above the contiguous land, from which a small portion of low coast extends for two degrees beyond it to the westward. The land of the northern shore of the gulf makes in mountainous ridges and peaks, the average height of which Captain Stokes estimated to be about 3,000 feet.

CAPE THREE POINTS rises to a lofty rocky mountain, nearly 2,000 feet high, the summit being of peaks and sharp serrated ridges, with a detached mass of rock of pyramidal form at the base, which shuts in with the land on the bearing of N. 51° E. The variation here is 20° 58′.

PORT HENRY is 3 miles to the N. E. of Cape Three Points. The shore between them is lined for nearly a league off with rocks and islets, of which several scores might be counted in the space of a square mile; but they seem to be of bold approach, and no dangers probably exist that are not above water, or are not shown by kelp.

Bound to Port Henry, a vessel should keep on the south side of the gulf, for the northern part is strewed with many rocks, and seemed to be exceedingly dangerous. The soundings, also, are very irregular, and the bottom is foul and rocky.

The entrance of Port Henry will be easily distinguished by its sandy beach, since it is the first that is observed on the south shore on entering the gulf. It is a small, light colored beach, with a lowish sandy cliff at the back, and a round, rocky and wooded mount at its western end. The Seal Rocks, also in the offing, are a good mark. They bear N. 12° E., 5 miles from the west point of the entrance, which is about a mile wide. The channel is bounded on each side by low rocks, lying off highish round rocky islets, that may be approached within one and a half cable's length. The soundings are from 20 to 26 fathoms, on a sandy bottom. Afterwards they decrease pretty gradually to the anchorage, which is in 9 and 10 fathoms.

When the sandy beach bears S. 19° E., mag., the fair way of the entrance will be quite open; and a vessel may stand in, keeping the round mount at the western end of the sandy beach on the larboard bow, until nearly abreast of it. She may then proceed up the harbor as high as convenient, and select her berth: for the ground is quite clear of danger to the line of rock-weed which skirts the shores and islets. The depth of water is between 12 and 8 fathoms, and the bottom generally of sand and mud.

In turning in there are some patches of kelp on each side, growing upon rocks that wash at high water, which must be avoided. Their positions are given in the plan.

As the squalls off the high land are sometimes very strong, it will be advisable for a ship to anchor as soon as possible, and warp up to her berth, which, from the smoothness of the water, may be easily effected. Any security may be obtained in this harbor. The plan will show that the basin at the bottom of the harbor is a complete wet dock. Wood and water at the sandy beach are in abundance.

It is high water at full and change within a few minutes of noon, and rises 5 feet. The stream of the tide, however, is very inconsiderable, and never exceeded half a mile an hour. The observations for latitude and longitude, &c., were made on a rock at the western side of the port, marked A, in the plan. The lat. is 50° 00′ 18″, long. 75° 15′ 11″. Variation of the compass. 20° 50′.

THE GULF OF TRINIDAD separates Wellington Island from Madre de Dios. It is nearly 10 leagues long, and from 4 to 8 miles wide. Its south shore, or north coast of Madre de Dios, is very much broken, and, probably, contains many ports. None of them were visited excepting for night anchorages. Under the east side of Division Island is Port de la Morro, which, with Point Candelaria and Port Rosario, are inserted from Sarmiento's account.

On the northern shore are two opening-like channels. The Westernmost probably communicates with the Fallos Channel; the other, Sarmiento's Brazo de Norte, or North Arm, appeared to trend under the base of the range of mountains, among which Cathedral mount is a conspicuous object. From the entrance of the strait this mountain resembles the spire and roof of a church, and is visible for more than 20 leagues. Between the two openings is Neesham Bay, in which the Adelaide found a secure anchorage in 11 fathoms. There is also good anchorage for a small vessel in Windward Bay.

The gulf meets the Wide Channel at its junction with Conception Strait, where the channel is contracted by an island to the width of one mile and a half. There are several isles and rocks in the gulf, of which the most remarkable are the Seal Rocks, before mentioned, the Van Isles, opposite the western channel, and a group of numerous islands extending for a league to the southward of the land to the westward of Neesham

Bay. On the south shore are also several isles, but they are near the coast, and are particularized in the chart. The most remarkable is Middle Island, which, with the reef off its S. W. end, is well described by Sarmiento.

The Island of Mount Corso is separated from Cape Brenton by Spartan Passage. For more than a league off Cape Primero are some extensive reefs; indeed the whole line of the west coast of Madre de Dios is fronted by rocks, some of which are 2 leagues from the shore. There are regular soundings in the entrance of the gulf, but the water deepens immediately after passing to the eastward of Port Henry.

PICTON OPENING and Dynely Bay very probably insulate the land that separates them, of which Cape Montague is the S. W. extreme. There are some rocks 8 or 10 miles off the coast to the southward; but between Cape Montague and Cape Dyer they are more numerous. Several are from 8 to 10 miles off the shore. Many are dry, some are awash, and others show only by the breaking of the sea. The coast to the north of Dynely Bay is very broken.

CAPE DYER is in lat. 48° 5′ 55″, long. 75° 34′ 35″. At 5 miles S. 86° W. from it is a rocky islet, called by Bulkely and Cummings "The Rock of Dundee," from its similarity "to that island in the West Indies, but not so large. It lieth about 4 leagues* from the southernmost point of land out at sea."

This rock is a good mark for Port Santa Barbara, from the entrance of which it bears S. 64° W., (S. W., mag.,) distant nine miles.

At one mile to the north of the rock, the depth is 23 fathoms, and gradually decreases on approaching Port Santa Barbara; in steering for which, as soon as Cape Dyer bears S. by compass, you will be close to some rocks, which you should keep on your larboard hand. Abreast of this rock, one-eighth of a mile off, the depth will be 11 fathoms. The channel here is one mile wide, but gradually narrows on approaching the south-west end of Breaksea Island; and at Wreck Point, the west head of the port, the width is about one-eighth of a mile. There are several rocks in this passage, but as the depth is from 6 to 8 fashoms, the anchor may be dropped, and the ship warped clear of them, in case of being becalmed: calms, however, are of rare occurrence here.

BREAKSEA ISLAND, more than two miles long, fronts the port, the heads of which are three-quarters of a mile apart. In the entrance of the port the depth is 3½ and 4 fathoms, and gradually decreases to 2½ fathoms, but at the bottom there is a basin with 6 and 8 fathoms in it. This is a very good harbor, and from the rare opportunity of anchoring your ship in a moderate depth, is easy of access. It is also readily made out by its vicinity to the Dundee Rock, which serves to point out its position.

The west head of the port is in latitude 48° 2′ 15″, and longitude 75° 29′ 45″: variation 19° 10′. High water takes place, at full and change, at 0h. 28m. and rises three to four feet (neaps.)

To the N. E. of Breaksea Island are many straggling rocks. The Beagle having entered the port by the western entrance, left it by threading the rocks to the eastward, in doing which, she had not less than 9 fathoms.

Between the island and the mouth of the port, the depth is from 6 to 7 fathoms, good ground, which renders the entrance and exit very easy.

FLINN SOUND is a deep opening to the eastward of the port; that was not examined.

POINT BYNOE, with the group of islands—Bynoe Islands, extending for two miles off it, is the west head of the Fallos Channel, which was explored for 30 miles without offering any interesting feature. Mr. Kirke, who examined it, describes it to be perfectly clear of rocks, and abounding in anchorages for small vessels, although the water is deep. The bottom is sandy. Its general width is one and a half to two miles. The western side of the mouth is a ridge of mountains; the eastern side is much lower, and very broken, and formed by many small islands. At five miles within it, on the west side, is our Lady's Bay, of the old charts. Fallos Channel probably communicates with the sea by Dynely Bay and Picton Opening: and, beyond the latter, was supposed to communicate with the Gulf of Trinidad by the channel to the west of Neesham Bay.

THE GUAIANECO ISLANDS, twenty miles in extent, are composed of two principal islands, and many smaller islets—the westernmost is called Byron Island, and the easternmost Wager Island. They are separated by Runnie Pass, called in Bulkely's Narrative, the Lagoon; on the west side, and at the north end of it, is Speedwell Bay.

RUNDLE PASS is only a ¼ of a mile wide, but perfectly clear in the whole extent of its channel, excepting the northern entrance; where it is guarded by many detached rocks, which render the entrance to Speedwell Bay rather difficult.† According to

* There must be a mistake here: it should probably have been four miles.

† Machado, the pilot who explored this coast in the year 1769, by order of the Governor of Chiloe, Don Carlos de Beranger, describes these islands at some length, but with a little confusion of bearings. The north end of Rundle Pass, he calls the west end, and the south outlet, the eastern. Byron's Island, he describes as being the southern island. I think his Port Ballenas must be on

Byron's and Bulkely's Narratives, the situation of the wreck of the Wager is near the west end of the north side of Wager Island. Harvey Bay and Good Harbor are mentioned by Bulkely. Off the western end of Byron Island are some rocky islets; and its north coast is also very much strewed with them, even to a considerable distance from the shore.

The Guaianeco Islands are separated from the land of Wellington Island by a clear, but, in some parts, narrow passage. At its S. W. end it is contracted by rocks to a mile and a half, and at the south end of Byron Island is scarcely a mile broad: afterwards, however, it widens to two and a half and three miles.

The north point of Wellington Island is Cape San Roman. It is the west head of the Mesier Channel.

TARN BAY is about five leagues wide. The Ayautau Islands are four miles from the coast, but the interval is occupied by several rocky reefs, between which Lieutenant Skyring thought there seemed to be a sufficiently clear passage. The pilot Machado, however, thought differently. The latter describes a small boat-haven on the larger island, but it is among rocks. Opposite to Ayautau is a port, called by the missionary voyagers, San Policarpo; which, from its exposure to the westward, I should not think very inviting. The ports of Tianitau and Asaurituan are also mentioned by the missionary priests, in their journals. The former is described to have many islands in its entrance, and to be to the northward of San Policarpo; and the latter to be to the south of Tianitau, and opposite to Ayautau.

The Channel's Mouth of the old chart is laid down, as well as all this part of the coast, from Machado's account, who describes the opening, and gives it latitude 47° 25′, which is only 3 miles in error. We found it to extend in a S. E. direction for eleven miles, and then to divide into two arms, one trending 15 miles to the eastward, and the other eleven miles south, where they terminate. They are merely deep and narrow arms of the sea, running between steep-sided ranges of mountains. The shores are rocky, and afford neither coves nor bights, nor even shelter for a boat, and are perfectly unproductive; for no seals nor birds were seen, and the shores were destitute even of shell fish.

CAPE MACHADO, in lat. 47° 27′ 35″, long. 74° 26′ 10″, is the north head of this opening. Two miles off it are two rocks, which the pilot carefully and correctly describes, as he also does the rocks and breakers which extend off the south head for nearly a league. The Beagle twice occupied an anchorage under the Hazard Isles, in the entrance, and on both occasions was detained many days from bad weather, with three anchors down.

Excepting this very bad and exposed anchorage, there exists none in the channel—Captain Stokes describes it to be an extremely perilous anchorage. "The anchors," he says, "were in 23 fathoms, on a bad bottom, sand and coral. The squalls were terrifically violent. Astern, at the distance of half a cable's length, were rocks, and low rocky islets, upon which a furious surf raged, and on which the ship must have been inevitably driven, if the anchors, of which three were down, had started."

Between Channels Mouth and Jesuit Sound, the coast is more unbroken and low than usual. In lat. 47° 17′ are some reefs which project two miles to sea; behind them there was an appearance of a bight, which may afford anchorage.

JESUIT SOUND, like Channels Mouth, is quite unfit to be entered by any ship. It terminates in two inlets, Benito and Julian. The former is bounded on either side by high mountains, and terminates in low land, with a rivulet that orginates in a large glacier. The latter ends in high mountainous land, with streams of water between the hills; one part of it is cliffy; and it has, on the S. W. side, a long sandy beach. In its entrance is a large island, making the passages on each side very narrow, and they are rendered still more so by rocks and islets.

Separated by Cheap Channel from the main is Xavier Island, the Montrose Island of Byron's Narrative. It is eleven miles and a half long, and four wide, and is very high and thickly wooded with lofty trees. The only two anchorages which the island affords are noticed and named by Machado, the northern one, Port Xavier, the southern Ignacio Bay.

The former is by much the better place, being secure from prevailing winds, with 17 fathoms at eight hundred yards from the shore. The south end of the bay is a sandy beach, backed by tall beach trees. The shore to the south of Xavier Bay, for the first four or five miles, consists of a high, steep clay cliff, with a narrow stony beach at its base, backed by mountains of twelve or fourteen hundred feet high, and covered by large and straight-stemmed trees. The remainder of the coast, to Ignacio Bay, is low, and slightly wooded with stunted trees; and its whole extent is lashed with a furious surf, that totally prevents boats from landing.

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the south side of Wager Island, for he describes it to be opposite to Cape Roman; therefore, Port Eustaquio should be on the north coast, probably in the strait within San Pedro Island.

IGNACIO BAY affords anchorage in 9 fathoms. The western coast of the island is lined by reefs extending two miles off, upon which the sea breaks high.

KELLY HARBOR is situated at the bottom of the north-east corner of the Gulf of Penas, in the bay formed between the land of St. Estevan Gulf and Xavier Island. It trends inwards in an easterly direction for eight miles. The land about the harbor is high, rugged and rocky, but by no means destitute of verdure. In the interior are lofty-peaked and craggy ranges of snow-covered mountains. The points of the entrances are two miles asunder, and are thickly wooded, and low, compared with the adjacent land; their magnetic bearing is N. 48° E. and S. 48° W. Between them is a channel of from 35 to 40 fathoms deep, over a mud bottom, without danger, to a cable's length of the rocky islets that fringe the shore for a quarter of a mile off. On approaching the harbor the remarkable muddied appearance of the water is rather startling: but the discoloration proceeds only from the freshes of the river, and the streams produced from a very extensive glacier that occupies many miles of the country to the north. The plan will show the depth of water. The course in is E. S. E. by compass, until in a line between the inner north point, and an inlet on the south shore that is fronted by five or six wooded islets. Then haul up along the larboard side of the harbor, as close to the shore and as far as you please to an anchorage. The best berth is when the two points of entrance are locked in with each other, and within a cable and a half of the sandy spit that extends off the western end of a high and thickly wooded island. The ground is excellent, and so tenacious, that it was with difficulty that the Beagle lifted her anchors. Shelter, wood and water, however, are the only advantages offered by the harbor. Environed by lofty mountains, some fourteen and eighteen hundred feet high, and ice-filled valleys and ravines—it is chill, damp and dreary. A few birds, and a small number of hair seals, were the only living animals seen by us. Not a trace of human beings was observed.

For knowing Kelly Harbor the glacier is a capital leading-mark. It is a large field of ice, lying on the low part of the coast, about 2 miles to the northward of the harbor. The water at the anchorage, at half tide, was perfectly fresh, but was too muddied to be fit for immediate use. When in the fair way of the harbor, the Sugar-loaf in Holloway Sound, will be seen just on with the end of the land, to the north of Purcell Island, bearing W. 1° N. by compass. The latitude of the north point of the harbor is 46° 59′, and the long. 74° 5′ 30″; the variation about 20°. The mountain on the south shore, 3½ miles east southerly from the north point, is 1,540 feet high.

ST. ESTEVAN GULF.—The entrance of this gulf, which is situated 9 miles north of the N. E. end of Xavier Island, is 4 miles wide. The land on the western side, Forelius Peninsula, is a narrow tongue of land nearly 5 leagues long. The eastern side of the gulf is a long sandy beach, curving round to the N. W. towards the entrance of the River San Tadeo, between which and Cirujano Island, forming the south, (or rather the west,) point of entrance, the width is less than 5 miles; and at a league farther to the westward, it is not more than 3½ miles across. Here, in the centre, there is a small islet, called Dead Tree Island.

Beyond this is St. Quentin Sound, 10 miles deep; and, at its N. W. corner, Aldunate Inlet extends in for about 8 miles. St. Quentin's Sound terminates in continuous low land, with patches of sandy beach, over which, among other lofty mountains, the Dome of St. Paul's is seen. The shores are thickly wooded with shapely and well grown trees; the land near the beach, for the most part, is low, rising into mountainous peaks; a little distance in the interior of which, some are 1,500 feet high, but they are not craggy.

ST. ESTEVAN GULF is one of the best harbors of the coast, being easy of access, and with moderate depth of water all over; with good holding ground, and a clean bottom. The best anchorage is at about 2 miles above Dead Tree Island, in from 4 to 6 fathoms, sandy bottom. This will be at 2 miles from either shore, but the berth is perfectly land-locked; and, if necessary, anchorage may be taken up much nearer to it.

CIRUJANO ISLAND, above mentioned, is that on which the surgeon of the Wager was buried.* The missionary priests describe a port on the island, called San Tomas. The island is separated from the extremity of Forelius Peninsula by a strait, one mile to three-quarters of a mile wide.

The mouth of the RIVER SAN TADEO, is easily distinguished on entering the gulf, by the sand hills on each side of its entrance, and the bearing of the east trend of Cirujano Island. S. W. ½ S. (by compass, S. by W. ¾ W.) A sandy beach extends to the east and west of it for many miles; the land is low and marshy, and covered with stumps of dead trees. It has a bar entrance, much of which must be nearly dry at spring tides. A heavy swell breaks upon it for its whole length, so that no opening or

* Of this circumstance I was informed by Pedro Osorio, an old soldier, whom I saw at Chiloe, who formed one of the party of the missionary voyagers. I asked him why it was called El Cirujano, to which he replied: "Porque alli murio el cirujano del Wager." (Because the Surgeon of the Wager died there.) Pedro Osorio knew Byron's party well, although it was 88 years since they visited the island.—See also Byron's Narrative, p. 147.

swatch-way is left, and excepting in very fine weather, it is very hazardous to cross. At the mouth the breadth is not more than a quarter of a mile: but, within the entrance it opens to a basin of some extent; and at 3 miles up it is 300 yards wide, after which it gradually narrows. Nine miles from the entrance, the stream is divided into two arms; the Northern or Black River, takes a northerly, and the other an easterly direction. The former is a strong and rapid stream, quite uninfluenced by tide, which, however, extends for a short distance up the eastern arm; after which, the current down becomes gradually as strong as in the Black River. The banks of the latter are comparatively barren to those of the Black River, where the wood is very thick. The courses of both arms are very tortuous, and the bed of the river so choked with trunks and branches of trees, as to prevent its complete exploration, as well as the detection of the Desecho, the place where the Indians carry their canoes across the Isthmus of Ofqui.

PURCELL ISLAND is separated from the land of Forelius Peninsula, by a good channel, 2 miles wide; it is moderately high, and thickly wooded, and about 6 miles in circuit. About mid-channel, and nearly abreast of the east end of the island, is a rock only a few feet above the water. The channel to the south of the rock, is from 18 to 22 fathoms deep, and the bottom sandy.

Upon the peninsula, opposite to the west end of Purcell Island, is an isthmus of low sandy land, scarcely a mile wide; the one over which, I think it may be inferred from the narrative, that the canoes in which Byron and his companions were embarked, were carried. One day's journey, by land, to the west of this isthmus, Byron describes a river, up which the Indian guides attempted to take the Wager's barge. This river, if it exists, probably falls into Bad Bay.

The Beagle anchored in BAD BAY after dark, in 8 fathoms, sandy bottom, and left it at 9 o'clock the following morning. Of this place, Captain Stokes remarks:—"At daylight we found that we had anchored in a small bay about half a mile off a shingle beach, on which, as well as on every part of the shore, a furious surf raged, that effectually prevented our landing to get chronometer sights. The mouth of this bay is N. 50° E., magnetic, 9 leagues from Cape Tres Montes, which, in clear weather, may be seen from its mouth. Like all this shore of the gulf, it is completely open to the S. W., and a heavy rolling sea. About 9 A. M. we left it, and proceeded to trace the coast to the south-east.

To the westward, between Bad Bay and the land of Cape Tres Montes, is an extensive bight, 16 miles wide and about 12 deep. The centre is occupied by a group of islands, called Marine Islands,* upon which the Sugar-loaf, a mountain 1,840 feet high, is very conspicuous; it was seen from the Wager the day before her wreck. Upon the main, 5¾ miles, N. 15° E., from the Sugar-loaf, is another equally remarkable mountain, called the Dome of St. Paul's, 2,284 feet high.

NEUMAN INLET, at the N. E. corner of this gulf, extends for 17 miles into the land, where it terminates; but it is of no use, as the water is too deep for anchorage. It is the resort of large numbers of hair seal. At the north-west corner is Hoppner Sound, about 5 miles in extent. At its south-west end is a deep inlet, extending 7 miles to the S. W., and reaching to within 2 miles of the sea coast, from which it is separated by an isthmus of low and thickly wooded land. Captain Stokes walked across it to the sea-beach, from whence he saw Cape Raper. The Beagle anchored at the bottom of Hoppner Sound, off the mouth of the inlet. The mouth of the sound is very much blocked up by the Marine Islands; but the southern channel, although narrow, has plenty of water. On the south-west side of the Marine Islands is Holloway Sound, in which is Port Otway, an inlet extending for 5 miles into the land, in a S. W. direction.

The entrance of PORT OTWAY is on the west side of Holloway Sound, about 14 or 15 miles distant from Cape Tres Montes, and may be readily known by its being the first opening after passing the cape. Off the mouth are the Entrance Isles, among which is the Logan Rock, having a strong resemblance to the celebrated rock whose name it bears. It is broad and flat at the top, and decreases to its base, which is very small, and connected to the rock on which it seems to rest. Immediately within the entrance on the west shore, is a sandy beach, over which a rivulet discharges itself into the bay. Here anchorage may be had in 9 or 10 fathoms. It is by far the most convenient one the port affords. The plan will show the particulars of the inlet, which contains anchorage all over it, but the depth is generally inconveniently great, from 20 to 30 fathoms.

CAPE TRES MONTES is a bold and remarkable headland, rising from the sea to the height of 2,000 feet. It lies in lat. 46° 58′ 57″, and lon. 75° 27′ 30″, and is the south extremity of the Peninsula of Tres Montes.

To the northward of it is Cape Raper, in lat. 46° 48′ 25″. Rocks and breakers extend off it for half a league to seaward.

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* It was here that four Marines voluntarily remained on shore during Byron's perilous boat voyage, after the wreck of the Wager. Byron's Narrative, p. 85.

POINT MITFORD REES, the northernmost land seen by the Beagle, is in lat. 46° 43′.

Of the WIND AND WEATHER.—The climate of the coast of Western Patagonia, described in this section, is cold, damp, and tempestuous. The reigning wind is N. W.; but if it blows hard from that quarter, the wind is very liable to shift suddenly round to the westward, and blow a heavy gale, which raises a mountainous cross sea. These westerly gales do not generally last long, but veer round to the southward, when the weather, if the barometer rises, will probably clear up. Should they, however, back round to the N. W. again, and the barometer keep low, or oscillate, the weather will, doubtless, be worse. Easterly winds are of rare occurrence; they are accompanied with fine clear weather; but westerly winds bring with them a constant fall of rain, and a quick succession of hard squalls of wind and hail.

Should a vessel be near the coast during one of these northerly gales, it would be advisable for her to make an offing as quickly as possible, to guard against the sudden shift to the westward that is almost certain to ensue. The discovery, however, of the anchorages of Port Henry, Port Santa Barbara, Port Otway, and St. Quentin's Sound, has very much reduced the dangers of the lee shore; and a refuge in either of them will always be preferable to passing a night on this coast in a gale of wind.

The barometer falls with northerly and westerly winds, but rises with southerly. It is at its minimum height with N. W. winds, and at its maximum when the wind is S. E. The temperature is rarely so low as 40 degrees, excepting in the winter months. At Port Otway, in the Gulf of Penas, the maximum and minimum for 19 days, in the month of June, were 51° and 27½°.

Of the TIDES.—High water, at most parts of this coast, takes place within half an hour on either side of noon. The stream is inconsiderable, and the rise and fall rarely more than 6 feet.

The variation of the compass, at the western entrance of the strait, is 23¾°; at Port Henry, 21°; at Port Santa Barbara, 19°; Xavier Island, 20°; and at Port Otway, 20½°.

Of the Interior Sounds and Channels between the Strait of Magalhaens and the Gulf of Penas.

The western coast, between the Strait of Magalhaens and the Gulf of Penas, is formed by a succession of islands of considerable extent, the largest of which, Wellington Island, occupies a length of coast of 138 miles. It is separated from the main by the Mesier and Wide Channels; and from Madre de Dios by the Gulf of Trinidad. Madre de Dios, which is probably composed of several islands, has, for its inner or eastern boundary, the Conception Strait.

HANOVER ISLAND has the Sarmiento and Esteven Channels on its eastern side, and on the south is separated from Queen Adelaide Archipelago by Lord Nelson Strait, which communicates by Smyth Channel with the Strait of Magalhaens.

SMYTH CHANNEL commences in the strait at Beaufort Bay, on the eastern side of Cape Phillip, N. 78° E., 5½ miles from which are the Fairway Isles; and at a little more than 6 miles from the cape, on the west shore, is the anchorage of Deep Harbor, the entrance of which is a quarter of a mile wide. The anchorage is about half a mile within the head, off the entrance of a lagoon, in from 30 to 35 fathoms. North and south of the port are inlets, each one mile deep. In entering, there is a patch of kelp on the starboard hand, and the shore is fronted for a short distance off by rocks.

GOOD'S BAY, the next anchorage, is better than the last, the depth being from 20 to 25 fathoms. It is convenient for vessels going to the northward, but when bound in the opposite direction, North Anchorage will be better, from the depth being less; but it is small, and the entrance is more fronted by rocks than Good's Bay. It is not intended to anchor in either of the above places. The widest and best channel is to the eastward of Middle Island. There is a plan of these anchorages.

Off the N. E. point of Shoal Island is a rocky patch, upon which the Adelaide struck. The channel for the next 4 miles is rather intricate; but all the dangers are pointed out.

Opposite to Cape Colworth is Clapperton Inlet, beyond which is a considerable tract of low country, a rare sight in these regions. Two miles further, on the eastern side, is Hose Harbor, suitable for a small vessel; and on the opposite shore is Retreat Bay, fronted by low rocky islets. The depth within is 24 fathoms.

Onwards the channel is clear, as far as Oake Bay, where the depth is 9 fathoms, but the anchorage is better among the Otter Islands, the depth being 6 and 7 fathoms, and the ground clean.

The channel, for the next 8 miles, becomes more strewed with islands and rocks, and has much shoal water off every low point. The coast, also, is very low on the eastern shore, as far as the base of Mount Burney, which is 5,800 feet high, and covered with perpetual snow.

The best channel is on the east side of the Otter Islands, and between the Summer

Isles and Long Island, for which the chart and a good lookout for kelp will be sufficient guides.

FORTUNE BAY is at the south-east extremity of, apparently, an island in the entrance of a deep channel, which is, probably, one that Mr. Cutler, the master of an American sealing vessel, passed through.* Upon the supposition of its leading through the land, and insulating the western shore of Smyth Channel, to the north of Point Palmer. The latter is distinguished by the name of Rennel Island. Fortune Bay is a very convenient and good anchorage, the depth being moderate and bottom good. The best berth is within Low Island, in from 8 to 12 fathoms. At the bottom of the bay is a thickly wooded valley, with a fresh water stream.

A league to the north of Point Palmer, on the opposite shore, is Ithmus Bay, affording excellent anchorage, but open to S. W., which here is not of much moment, for the channel is only two miles wide. The bottom of Isthmus Bay is formed by a very narrow strip of land separating it from what I have no doubt is Sarmiento's Oracion Bay. Five miles north of Point Palmer is Welcome Bay, also affording an excellent place to anchor in, with moderate depth and good bottom. A plan was made of it.

In SANDY BAY, on the east side of the channel, and off Inlet Bay, on the opposite shore, there are good anchorages. Both have a moderate depth, and are sheltered from the prevailing winds, which generally are north-westerly.

In lat. 52° 1′ is Victory Passage, separating Zach Peninsula from Hunter Island, and communicating with Union Sound, which leads to the Ancon Sin Salida of Sarmiento. On the west side of Hunter Island is Island Bay, with good anchorage both to the north and south of the islets. The Adelaide anchored in the latter in 17 fathoms.

At the south extremity of Piazzi Island is Hamper Bay, with anchorage in from 7 to 15 fathoms. Here the channel widens to three miles and a half; but at two leagues farther on, near Ceres Island, under the S. E. end of which the Adelaide anchored in 10 fathoms, it narrows to two miles. Rocky Cove is not to be recommended, and Narrow Creek seems confined.

Hence to the mouth of the channel, which again widens here to 5 miles, and in which, during strong north-west winds, the sea runs heavy, we know of no anchorage; but a small vessel in want will doubtless find many, by sending her boat in search. The Adelaide anchored among the Diana Islands, and in Montague Bay, having passed through Heywood Passage. The northern point of Piazzi Island is Sarmiento's West Point, (Punta del Oeste,) and a league to the south is his Punta de Mas-al-Oeste, or Point-more-West. Lieutenant Skyring concludes the journal of his survey of Smyth Channel with the following remarks:

"So generally, indeed, do the northerly winds prevail, that it would be troublesome even for a working vessel to make a passage to the northward; but it is a safe channel for small craft at any time. The tides are regular: the rise and fall at the southern entrance is 8 and 9 feet, but at the northern only 5 and 6. The flood tide always sets to the northward, and the strength of the stream is from half to one mile and a half an hour; so that a vessel is not so likely to be detained here for any length of time, as she would be in the Strait of Magalhaens, where there is little or no assistance felt from westerly tides. The channel besides is comparatively free from sea, and the winds are not so tempestuous." —[Skyring's MS.]

As the sounds within Smyth Channel will never be used for any purpose of navigation, little need be said in a work destined solely for the use of shipping frequenting the coast. The chart will be sufficient to refer to for every purpose of curiosity or information. They possess many anchorages for small vessels, affording both shelter and security.

Sarmiento on his third boat voyage to discover a passage through the land into the Strait of Magalhaens, gives a detailed and very interesting account of his proceedings. All his descriptions are so good, that we had no hesitation in assigning positions to those places he mentions, to all of which his names have been appended. Cape Ano-nuevo cannot be mistaken, and the description of his Ancon Sin Salida is perfect. He says "the Morro of Ano-nuevo trends round to the S. E. and S. S. E. for a league, to the first water ravine that descends from the summit. In an east direction from this, appears a large mouth of a channel, about two leagues off. We went to it, and found it to be a bay without a thoroughfare, forming a cove to the north, about a league deep; so that, finding ourselvas embayed, we returned to the entrance, which we had previously reached with great labor and fatigue. This bight has four islets. The bay, from the islets to the westward, has a sandy beach, backed by a low country for more than a league and a half to the Morro of Ano-nuevo."

The anchorages that were used by the Adelaide upon the examination of the interior sounds, were as follows:

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* We met this intelligent person two or three different times whilst employed upon the survey, and received much valuable, and what afterwards proved to be correct, information from him, which I am here much gratified to have an opportunity of acknowledging.—[P. P. K.]

LEEWARD BAY, exposed, and being upon the leeward shore, is not to be recommended.

WHALE BOAT BAY, about one mile to the east of Grey Cape.

A small cove on the north shore of Kirke Narrows, about a mile to the east of Cape Retford.

FOG BAY, two miles and a half to the north of the east end of Kirke Narrows.

EASTER BAY, a convenient anchorage within White Narrows.

The Canal of the Mountains, nearly 40 miles long, is bounded on each side by the high snow-capped Cordillera, the western side being by very much the higher land, and having a glacier of 20 miles in extent, running parallel with the canal. Eighteen miles from Cape Earnest, where the canal commences, the channel is contracted to the width of about half a mile; otherwise its width is from one to two miles.

WORSLEY BAY AND SOUND extend 15 miles into the land.

LAST HOPE INLET is 40 miles in length. Its mouth is 3½ miles wide, but at 8 miles the breadth is contracted by islands* to less than a mile, the channel being 5 to 14 fathoms deep. Beyond this narrow the sound trends to the W. N. W.

DISAPPOINTMENT BAY.—The land at the bottom is very low, and thickly covered with stunted wood. Mr. Kirke traced its shores, and found them to be formed by a flat stony beach, and the water so shallow that the boat could seldom approach it within a quarter of a mile. A considerable body of water was noticed by him over the low land, probably a larger lagoon, for it communicates with the bay by a rapid stream 50 yards wide. No high land was seen in an easterly direction; so that the country between Disappointment Bay and the eastern coast may probably be a continued pampa, or plain, like the coast of Eastern Patagonia.

OBSTRUCTION SOUND extends for thirty miles in a south by east direction, and then for fifteen more to the W. S. W., where it terminates. It is separated from the bottom of Skyring Water by a ridge of hills, perhaps twelve miles across. Some water was seen from a height, about six miles off, in the intervening space, but the shores were so carefully traced that Lieutenant Skyring, who examined it, feels satisfied that no communication exists. This question, however, will probably be set at rest by Captain Fitzroy, during his intended voyage.

A large plan was made of these sounds, to which a reference will give every desired information.

SARMIENTO CHANNEL, communicating between the east side of Piazzi Island and Staines Peninsula, continues to the northward of the mouth of Peel Inlet, where it joins the San Estevan Channel, from which it is separated by the Islands of Vancouver and Esperanza. Between these is a passage nearly a league wide, but strewed with islands.

RELIEF HARBOR, at the south end of Vancouver Island, is a convenient anchorage; but the best hereabouts is Puerto Bueno, first noticed by Sarmiento. It affords excellent anchorage and a moderate depth of water, the latter of very unusual occurrence. A small cove, round the north point, called Schooner Cove, is well adapted for a small vessel, and may be used in preference even to Puerto Bueno.

In SAN ESTEVAN CHANNEL, Escape Bay, although small, is convenient and well sheltered. Opposite the south end of Esperanza Island is the deep opening of Ellen Bay, which may probably be a channel passing through and dividing Hanover Island. To the north the anchorages of Rejoice Harbor and Anchor Bay are commodious and useful.

PEEL INLET extends in for 7 leagues, communicating with Pitt Channel, and insulating Chatham Island, which is separated from the N. end of Hanover Island by a continuation of the Sarmiento and San Estevan Channels, of which the principal feature is the Guia Narrows.† These narrows are 6 miles long, and, excepting the north end, where it is only one-fifth of a mile wide, are from half to one mile broad. The tides here are not very rapid. High water at full and change takes place at 2h. 8m., the flood running to the southward. At the south entrance of San Estevan Channel, the reverse is the case, of which, for vessels passing through, some advantage may be taken.

The north-west coast of Chatham Island has many bights and coves fronted by islands, among which is Guard Bay, where the Adelaide anchored; but the coast is too exposed to the sea and prevailing winds, to offer much convenient or even secure shelter.

The north-west points of Hanover and Chatham Islands are more than ten miles apart, and midway between them is situated Sarmiento's Innocent's Island (Isla de los Ignocentes.)

CONCEPTION STRAIT separates Madre de Dios and its island to the southward

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* These islets were covered with black-necked swans, and the sound generally is well stocked with birds.

† So called after Sarmiento's Boat. It was by this route he passed down to the examination of his Ancon Sin Salida. He describes it as a narrow, 300 paces wide.

from the main land. It commences at Cape Santiago, in lat. 50¾°, and joins the Wide Channel, or Brazo Ancho of Sarmiento in 50° 5′. On the west side (the eastern coast of Madre de Dios) are several convenient anchorages, particularly Walker Bay, a bay to the north of Point Michael, and Tom Bay, all of which, being on the weather shore, afford secure anchorage; but the squalls off the high land are not less felt than in other parts.

ST. ANDREW SOUND is four leagues wide; but the mouth is much occupied by the Canning Isles, upon the northernmost of which, at the south-west end, is Portland Bay, a good anchorage for a small vessel, in 9 fathoms. The principal entrance of St. Andrew Sound is to the north of Chatham Island. It is 5 miles wide, and at 6 leagues within, divides into two arms; the northern one is 5 or 6 leagues long, and terminates; but the southern channel, which is Pitt Channel, trending behind Chatham Island, and communicates, as before mentioned, with Peel Inlet.

The anchorage of Expectation Bay, 5 leagues within the sound, at the east extremity of the Kentish Isles, was used by the Adelaide in her examination of these inlets.

At POINT BRAZO ANCHO the Gulf of Trinidad commences, and the Conception Strait terminates; for its continuation to the north-east bears the name of Wide Channel, which is 40 miles long, and from 1¾ to 3½ miles broad.

At SAUMAREZ ISLAND it joins the Mesier Channel, and to the N. E. communicates with Sir George Eyre Sound, which is 40 miles long, and with an average breadth of 4 miles. Near the entrance on the east side was found a large rookery of seals, and another, 13 miles farther up, on the same side, in lat. 48° 21′.

The southern end of the Mesier Channel, for nearly 10 leagues, is named Indian Reach. It is narrow, and has many islets, but the water is deep. Then follows English Narrows, 12 miles long, and from half to one mile and a quarter wide; but many parts are contracted by islands to 400 yards. The passage lies on the west side of the channel, to the westward of all the islands.

From the north end of the narrows to the outlet of the Mesier, at Tarn Bay, in the Gulf of Penas, a distance of 75 miles, the channel is quite open and free from all impediment.

THE ANCHORAGES in the Wide and Mesier Channels, are more numerous than we have any account of. Those occupied by the Adelaide in her course through, are as follows, viz:

FATAL BAY, in lat. 47° 55′ on the western shore, at the north entrance of the channel, insulating Millar Island. This bay is open and exposed.

ISLAND HARBOR, on the east shore, in lat. 48° 6′ 3″, is a small but excellent land-locked anchorage, with good holding ground. Wood and water close at hand, and abundance of fish.

WATERFALL BAY, in lat. 48° 17′; at the entrance of an inlet on the east side of the channel.

At this part of the Mesier Channel the tides are regular, and run 6 hours each way, the flood setting N. by W.

WHITE KELP COVE, on the north side of Lion Bay, about one mile within the head, is confined, and only fit for a small vessel.

HALT BAY, on the east shore, at the north end of the English Narrows, in lat. 48° 54′. Here the flood sets to the S. S. E., and the tide being confined by the narrow width of the channel, runs with considerable strength.

LEVEL BAY, on the eastern side of the channel, at the south end of the narrows, is in lat. 49° 7′ 30″.

ROCKY BIGHT, opposite the north-east point of Saumarez Island, in from 17 to 12 fathoms.

FURY COVE, near Red Cape, the extremity of Exmouth Promontory. It is very confined, there not being room for more than two small vessels; but the ground is good, and although open to the S. W., it is a secure haven.

SANDY BAY, on the west shore of Wide Channel, in lat. 49° 45′ 30″.

SMALL CRAFT BIGHT, also on the west shore, near the south end of the Wide Channel, is of small size, but answers every purpose of a stopping place for the night.

OPEN BAY, on the east shore, opposite the Gulf of Trinidad. The anchorage is sheltered by two islands: but it is too exposed to trust a vessel in, and therefore not to be recommended.

Besides the above anchorages, there are many equally convenient, and, perhaps, much better, that may be occupied by vessels navigating these channels. Every bight offers an anchorage, and almost any may be entered with safety. On all occasions the weather shore should be preferred, and a shelving coast is generally fronted by shoaler soundings, and more likely to afford moderate depth of water than the steep-sided coasts; for in the great depth of water alone consists the difficulty of navigating these channels.

Throughout the whole space between the Strait of Magalhaens and the Gulf of Penas, there is abundance of wood and water, fish, shell fish, celery, and birds.

Remarks upon the Passage round Cape Horn, and to and from the Atlantic and Pacific Oceans, through the Strait of Magalhaens.

Ships bound from the Atlantic to any of the ports in the Pacific, will find it advantageous to keep within 100 miles of the coast of Eastern Patagonia, as well as to avoid the heavy sea that is raised by the westerly gales which prevail to the eastward, and increase in strength according to the distance from the land, as to profit by the variableness of the wind when fixed in the western board. Near the coast, from April to September, when the sun has north declination, the winds prevail more from the W. N. W. to N. N. W., than from any other quarter. Easterly gales are of very rare occurrence, but even when they do blow, the direction being obliquely upon the coast, I do not consider it at all hazardous to keep the land on board. In the opposite season, when the sun has south declination, the winds will incline from the southward of west, and frequently blow hard; but as the coast is a weather shore, the sea goes down immediately after the gale. In this season, although the winds are generally against a ship's making quick progress, yet as they seldom remain fixed in one point, and frequently shift backward and foreward 6 or 8 points in as many hours, advantage may be taken of the change so as to keep close in with the coast.

Having once made the land, which should be done to the southward of Cape Blanco, it will be beneficial to keep it topping on the horizon, until the entrance of the Strait of Magalhaens be passed.

With respect to this part of the voyage, whether to pass through the Strait le Maire, or round Staten Island, much difference of opinion exists. Prudence, I think, suggests the latter; yet I should very reluctantly give up the opportunity that might offer of clearing the strait, and therefore of being so much more to windward. With a southerly wind, it would not be advisable to attempt the strait; for, with a weather tide, the sea runs very cross and deep, and might severely injure and endanger the safety of a small vessel, and to a large one do much damage. In calm weather it would be still more imprudent, (unless the western side of the strait can be reached, where a ship might anchor,) on account of the tide setting over to the Staten Island side, where, if it becomes necessary to anchor, it would necessarily be in very deep water, and close to the land. With a northerly wind the route seems not only practicable, but very advantageous, and it would require some resolution to give up the opportunity so invitingly offered. I doubt whether northerly winds, unless they are very strong, blow through the strait—if not, a ship is drifted over to the eastern shores, where, from the force of the tides, she must be quite unmanageable.

Captain Fitz Roy, whose authority, from his experience, must be very good, seems to think there is neither difficulty nor risk in passing the strait. The only danger that does exist, and that may be an imaginary one, is the failure of the wind. Ships passing through it from the south, are not so liable to the failure of the south-westerly wind, unless it be light, and then it will probably be from the N. W. at the northern end of the strait. The anchorage in Good Success Bay, however, is admirably situated, should the wind or tide fail.

In passing to leeward of Staten Island, the tide race, which extends for some distance off Cape St. John, at the N. E. end of the island, must be avoided, otherwise there exist no dangers.

The anchorage under New-Year's Islands, although it is a wild one and the bottom bad, and the tide very strong, yet offers good shelter from south-west winds, and might be occupied with advantage during the existence of a gale from that quarter, since it is unfavorable for ships bound round the Horn,

After passing Staten Island, if the wind be westerly, the ship should be kept upon the starboard tack, unless it veers to the southward of S. S. W., until she reaches the latitude of 60° south, and then upon that tack upon which most westing may be made. In this parallel, however, the wind is thought to prevail more from the eastward than from any other quarter. Never having passed round Cape Horn in the summer season, I may not perhaps be justified in opposing my opinion to that of others; who, having tried both seasons, give the preference to the summer months. The advantage of long days is certainly very great, but from my experience of the winds and weather during these opposite seasons at Port Famine, I preferred the winter passage; and in our subsequent experience of it, found no reason to alter my opinion. Easterly and northerly winds prevail in the winter off the cape, whilst southerly and westerly winds are constant during the summer months; and not only are the winds more favorable in the winter, but they are moderate in comparison to the fury of the summer gales.

Having passed the meridian of Cape Pillar, it will yet be advisable to take every opportunity of making westing in preference to northing, until reaching the meridian of 82° or 84°, which will enable a ship to steer through the north-westerly winds that prevail between the parallels of 50° and 54°. (See Hall's South America, Appendix.)

With respect to the utility of the Barometer as an indicator of the weather that is ex-

perienced off Cape Horn, I do not think it can be considered so unfailing a guide as it is in the lower or middle latitudes. Captain Fitz Roy, however, has a better opinion of the indications shown by this valuable instrument; my opinion is, that although the rise or fall precedes the change, yet it more frequently accompanies it. The following sketch of the movement of the barometer, and of the weather that we experienced, may not be without its use.

Being to the north of Staten Island for 3 days preceding full moon, which occurred on the 3d of April, 1829, we had very foggy weather, with light winds from the eastward and northward, causing a fall of the mercury from 29·90 to 29·56. On the day of full moon the column rose, and we had a beautiful morning, during which the high mountains of Staten Island were quite unclouded, as were also those of Tierra del Fuego. At noon, however, a fresh gale from the S. W. set in, and enveloped the land with a dense mist. No sooner had the wind changed, than the mercury rose to 29·95, but fell again the next morning; and with the descent the wind veered round to, and blew strong from N. W., with thick cloudy weather and rain, which continued until the following noon, when the wind veered to S. W., the barometer at 29·54, having slightly risen; but after the change it fell and continued to descend gradually until midnight, when we had a fresh gale from the W. S. W. When this wind set in, the mercury rose, and continued to rise, as the wind veered, without decreasing in strength, to S. S. W., until it reached 29·95, when it fell again and the weather moderated, but without any change of wind. During the descent of the mercury, the sky with us was dull and overcast, with squalls of wind and rain, but on shore it seemed to be very fine sunshiny weather.

The column now fell to 29·23, and during its descent the weather remained the same, dull and showery; but as soon as the mercury became stationary, a fresh breeze set in from the southward, with fine weather.

After this to new moon, the weather was very unsettled, the wind veering between S. and W. S. W., the barometer rising as it veered to the former, and falling as it became more westerly; but on no occasion did it precede the change.

The mean height of the barometer is about 29·5.

The mercury stands lowest with N. W. winds, and highest with S. E.

With the wind at N. W., or northerly, the mercury is low; if it falls to 29 inches, or 28·80, a S. W. gale may be expected, but does not commence until the column has ceased to descend. It frequently, however, falls without being followed by this change. In the month of June, at Port Famine, the barometer fell to 28·17, and afterwards gradually rose to 30·5, which was followed by cold weather, in which the thermometer stood at 12°.

The following table shows the mean temperature and pressure as registered at the Observatory at Port Famine, in the Strait.

1828.	Temperature.	Pressure.
February, ..	51·1	29·40
March, ...	49·4	29·64
April, ...	41·2	29·57
May, ...	35·5	29·30
June, ...	32·9	29·28
July, ...	33·0	29·57
August, ...	33·2	29·28

Of the Passage to and from the Atlantic and Pacific Oceans, by the Strait of Magalhaens.

The difficulties that present themselves to navigators, in passing round Cape Horn, as well from adverse winds as the severe gale and heavy sea that they are exposed to, are so great, that the Strait of Magalhaens has naturally been looked to as a route by which they may be avoided. Hitherto no chart has existed in which much confidence could be placed; but by the present survey, the navigation through it, independent of wind and weather, has been rendered much easier; since a correct delineation of its shores, and plans of the anchorages, have been made; and in the preceding pages sufficient de-

scriptions of them have been given to assure the navigator of his place, and furnish him with advice as to his proceedings. The local difficulties, therefore, have been removed, but there remain much more serious ones, which I should not recommend a large, or even any but a very active and fast-sailing square-rigged vessel, to encounter, unless detention be not an object of importance.

For a square-rigged vessel bound through the strait, the following directions will be useful:—

In the eastern entrance, the winds will frequently favor a ship's arrival off the First Narrow; where, if she selects a good anchorage on the bank which bounds the northern side of the channel, she may wait an opportunity of passing through the First Narrow, and of reaching Gregory Bay; where also a delay may safely be made, for the purpose of passing the Second Narrow, and arriving at the neighborhood of Cape Negro; at which place the difficulties and dangers of the eastern entrance cease.

The dangers being carefully placed on the chart, and sufficiently described in the preceding part of this memoir, nothing need be repeated here; and indeed much must be left to the judgment and discretion of the navigator.

The passage of the First Narrow, the anchorage to the eastward of, and in Gregory Bay, the passage of the Second Narrow, the anchorage to the north of Elizabeth Island, and the passage round its south side, have already been described.

The tides answer best for vessels entering the strait at the period of full and change of the moon, since there are two westerly tides in the day. In the winter season, if the morning tide be not sufficient to carry a vessel through the First Narrow, she may return to Possession Bay, select an anchorage, and be secured again before night: or, in the summer, if she has passed the Narrow, and enabled to anchor for the tide, there will be sufficient day-light for her to proceed with the following tide to Gregory Bay, or at least to a safe anchorage off the peaked hillocks, on the north shore.

I have twice attempted to pass the First Narrow, and been obliged to return to the anchorage in Possession Bay; and twice I have passed through it against a strong breeze blowing directly through, by aid of the tide, which runs, in the narrowest parts, at the rate of 10 or 12 miles an hour. When the tide and wind are opposed to each other, the sea is very deep and heavy, and breaks high over the decks; it is, therefore, advisable to close reef, or lower the topsails on the cap, and drift through; for the tide, if at the springs, will generally be sufficient to carry a ship to an anchorage, although not always to one that it would be safe to pass the night at. On this account it would be prudent to return; for although the holding ground is exceedingly good, yet to part in the night, or drift towards, or through the Narrow, could scarcely happen without accident.

In leaving the anchorage in Gregory Bay, attention must be paid to the tide, which continues to run to the eastward in the Second Narrow, 3 hours after it has commenced to set to the S. W. at the anchorage.

With a leading wind through the Second Narrow, a ship will easily reach an anchorage off Laredo Bay; but if the tide fails upon emerging from it, she should seek for a berth in the bay to the north of Elizabeth Island, as near to the island as possible, but to the westward of its N. E. end, to be out of the influence of the tide. The depth of water, however, will be the best guide.

Directions to pass round the south side of Elizabeth Island have already been given; and as this part offers some dangers, the chart and the description should be carefully referred to.

The only advice that seems wanting to improve the directions of the coast from this to Port Famine, is, with a south-westerly wind, to keep close to the weather shore, in order to benefit by the flaws down the valleys; but this must be done with caution, in consequence of the squalls off the high land, the violence of which, to a person unaccustomed to them, cannot be well imagined.

The fourth section gives an account of the anchorages between Port Famine and Cape Froward, of which the only convenient one for a ship is St. Nicholas Bay, and to which, if defeated in passing round the cape, a ship had better return; for it is easy to reach as well as to leave, and extremely convenient to stop at, to await an opportunity of proceeding.

From Cape Froward to the westward, unless favored by a fair wind, it is necessary to persevere and take advantage of every opportunity of advancing step by step. There are several anchorages that a ship may take up, such as Snug Bay, off Wood's Bay, near Cape Coventry, in Fortescue Bay, Elizabeth Bay, and York Roads. These are before described. To the westward, in Crooked Reach, the anchorages are not so good, and, excepting Borja Bay, none seem to offer much convenience. Borja Bay, however, is well calculated to supply the deficiency, although for a square-rigged vessel there must be some difficulty in reaching it.

LONG REACH is both long and narrow, and ill supplied with anchorages for a ship. Such as they are, Swallow Harbor, Playa Parda, Marian's Cove, and Half Port Bay,

seem to be the best. In thick weather, although the channel is very narrow, yet one side is scarcely visible from the other, and the only advantage it has over other parts of the strait is the smoothness of the water. In Sea Reach there is a heavy rolling swell, with a short and deep sea, which renders it very difficult to beat to windward.

TAMAR HARBOR, Valentine Harbor, Tuesday Cove, and the Harbor of Mercy, are the best anchorages; and the latter is particularly convenient to occupy to await an opportunity of sailing out of the strait.

In the entrance the sea runs very heavy and irregularly during and after a gale; so that a ship should not leave her anchorage in the Harbor of Mercy, without a fair or a leading wind to get her quickly through it.

For small vessels, particularly if they be fore-and-aft rigged, many, if not all of the local difficulties vanish; and inlets which a ship dare not or cannot approach, may be entered with safety, and anchorage easily obtained by them. A large ship will perhaps be better off in entering and leaving the strait where there is open space, and frequently a heavy sea; but for the navigation of the strait, a small vessel has considerably the advantage. She has also the opportunity of passing through the Cockburn Channel, should the wind be north-westerly, which will very much reduce the length of the passage into the Pacific.

One very great advantage to be derived from the passage through the strait, is the opportunity of obtaining as much wood and water as can be required, without the least difficulty. Another great advantage is, that by hauling the seine during the summer months, from January to May, at the mouth of the river, or along the beaches in Port Famine, at the first quarter flood, a plentiful supply of fish may be obtained. Excellent fish are also caught at the anchorage with the hook and line, at all seasons, early in the morning or late in the evening. Fish may also be obtained with the seine at any other place where there are rivers. Freshwater Bay and Port Gallant are equally productive. On the outer coast of Tierra del Fuego an excellent fish may be caught in the kelp.

Directions for passing through the Strait of Magalhaens, from the Pacific to the Atlantic.

The advantage which a ship will derive from passing through the strait, from the Pacific to the Atlantic—for there must be some great one to induce the seaman to entangle his ship with the land, when fair winds and an open sea are before him—is very great. After passing through the strait, the prevailing winds being westerly, and more frequently from the northward than from the southward of west, they are fair for his running up the coast; or if not, the ship is not liable to receive much injury from the sea, which is comparatively smooth; whereas, to a ship passing round the Horn, if the wind be N. W., she must go to the eastward of the Falkland Islands, and be exposed to strong gales, and a heavy beam sea, and hug the wind to make her northing. To a small vessel the advantage is incalculable; for, besides filling her hold with wood and water, she is enabled to escape the severe weather that so constantly reigns in the higher latitudes of the South Atlantic Ocean.

Coming from the northward, it will be advisable to keep an offing until the western entrance of the strait is well under the lee, to avoid being thrown upon the coast to the northward of Cape Victory, which is rugged and inhospitable, and forming, as it were, a breakwater to the deep rolling swell of the ocean, is for some miles off fringed by a cross hollow sea almost amounting to a rippling.

The land of Cape Victory is high and rugged, and much broken; and if the weather be not very thick, will be seen long before the Evangelists, which are not visible above the horizon from a ship's deck for more than 4 or 5 leagues.* Pass to the southward of them, and steer for Cape Pillar, which makes like a high island. In calm weather do not pass too near to the cape, for the current sometimes sets out, and round the cape to the southward; but with a strong wind get under the lee of it as soon as you please, and steer along the shore. In the night it will be advisable to keep close to the land of the south shore; and if a patent log be used, which no ship should be without, your distance will be correctly known. The course along shore, by compass, is E. ¾ S., and if the weather be thick, by keeping sight of the south shore, there will be no difficulty in proceeding with safety.

The Adventure entered the strait on the 1st of April, 1830, at sunset; and after passing within half a mile of the islets off the Harbor of Mercy, steered E. ¾ S., magnetic, under close-reefed topsails, braced by, the weather being so squally and thick that the land was frequently concealed from us; but it being occasionally seen, the water being quite smooth, and the course steadily steered, with the patent log to mark the distance run, we proceeded without the least anxiety, although the night was dark, and the squalls of wind and rain frequent and violent. When abreast of Cape Tamar, that projection was clearly distinguished, as was also the land of Cape Providence, which served to

* From the Adventure's deck, the eye being thirteen feet above the water, they were seen on the horizon at the distance of fourteen miles.

check the distance shown by the patent log, but both giving the same results proved that we had not been subjected to any current; whereas the account by the ship's log was very much in error, in consequence of the violence of the squalls and the long intervals of light winds, which rendered it impossible to keep a correct account of the distance. At day-break we were between Cape Monday and the Gulf of Xaultegua; and at 8 o'clock we were abreast of Playa Parda, in which, after a calm day, the ship was anchored.

In the summer season there is no occasion to anchor any where, unless the weather be very tempestuous, for the nights are short and hardly dark enough to require it, unless as a precautionary measure, or for the purpose of procuring wood and water, the best place for which is Port Famine, where the beaches are strewed with abundance of logs of well seasoned wood, which is very superior to the green wood that must otherwise be used.

Nothwstanding the Adventure experienced no current in the western part of the strait, there is generally a set to the eastward, which is more or less felt according to circumstances. The direction and strength of the currents are caused by the duration of the gales.

The chart will be a sufficient guide for vessels bound through from the westward as far as Laredo Bay, after which a few directions will be necessary. The land here should be kept close on board, to avoid the reef off the S. W. end of Santa Magdalena. Being abreast of it, bear away, keeping the N. E. extremity of Elizabeth Island on the starboard bow, until you see Santa Martha in one with, or a little to the southward of, the south trend of the Second Narrow, (Cape St. Vincent,) which is the leading mark for the fair channel until you pass the spit of shoal soundings, which extends across to St. Magdalena. There are also shoal soundings towards the S. W. end of Elizabeth Island. At half a mile off we had 5 fathoms, Cape St. Vincent being then the breadth of Santa Martha open to the northward of that island. Keeping the cape just in sight to the northward of Santa Martha, steer on, and pass round the low N. E. extremity of Elizabeth Island, off which are several tide eddies. The tide here sets across the channel.

Now steer for the Second Narrow, keeping Cape Gregory, which will be just discernible as the low projecting extreme of the north side of the Second Narrow, on the starboard bow, until you are three miles past Santa Martha. The course may then be directed for the cape, opening it gradually on the larboard bow as you approach it, to avoid the shoal that extends off it.

If you anchor in Gregory Bay, which is advisable, in order to have the whole of the tide for running through the First Narrow, haul up and keep at a mile and a half from the shore. When the north extremity of the sandy land of the cape is in a line with the west extreme of the high table land, you will be near the anchorage; then shorten sail, and when the green slope begins to open, you will have 14 fathoms: you may then anchor, or keep away to the N. E., and choose a convenient depth, taking care not to approach the shore, so as to bring Cape Gregory to the southward of S. by W. ¼ W., (by compass.) The best berth is with the cape bearing S. S. W.

Hence, to the First Narrow, the course, by compass, is due N. E. by E.* The land at the entrance, being low, will not at first be perceived, but on steering on you will first see some hummocky land, making like islands. These are hills on the eastern or Fuegian side of the Narrow. Soon afterwards a flat low sand-hill will be seen to the northward, and this is at the S. W. extremity of Point Barranca. On approaching the Narrow at 4 miles off, keep a cliffy head, 4 or 5 miles within the east side of the Narrow, open of the trend of Point Barranca, by which you will avoid the shoal that extends off the latter point. You should not go into less depth than 6 fathoms. At most times of the tide there are long lines and patches of strong ripplings through which you must pass. The shoal is easily distinguished by the kelp.

When the channel through the Narrow bears, by compass, N. by E. ¾ E., steer through it; and that, or a N. N. E. course, will carry you through. On each side the bank extends off for some distance; but by keeping in mid-channel, there is no danger until the cliffy coast be passed, when reefs extend off either shore for some distance, particularly off Cape Orange. The N. N. E. course must be kept until the Peak of Cape Orange bears S., and the northern Direction Hill W. S. W., or W. by S. ½ S., by compass. Then steer E. N. E. for Cape Possession, taking care not to approach too near to the bank off Cape Orange, or the one on the north side of Possession Bay, for which the chart must be consulted.

For a small vessel, the passage through the strait from west to east is not only easy, but to be strongly recommended as the best and safest route. Indeed, I think the passage would be quite as expeditious, and, perhaps, much safer, to enter the Gulf of Trini-

* If from the Second Narrow, N. E. ¼ E. will be the compass course; but I should recommend a ship hauling up to the northward until abreast of Cape Gregory, and then to steer as above.

dad, and pass down the Conception Strait, the Sarmiento, or St. Estevan Channels, and Smyth's Channel, and enter the strait at Cape Tamar. In these channels northerly winds prevail, and there is no want of convenient and well sheltered anchorages for the night, many of which have already been mentioned, and multitudes of others, and perhaps much better ones, might be found.

GULF STREAM, AND STRAIT OF FLORIDA.

That immense current which continually sets from the Gulfs of Mexico and Florida, to the northward and north-eastward, should be well understood, as all who navigate the coast of North America, experience more or less of its influence.

Three degrees to the N. N. E. of Vera Cruz, the current has been found setting to the N. E. one mile an hour. Then N. N. E. and N. by E., and again N. E., nearly to the parallel of 25½°, long. 91½°. Here it changes more to the east, and becomes in lat. 26° E. by S., changing southward to S. E. by S. In the direction of the River Mississippi, and lat. 25° 30′ N., the current sets variously to the south-eastward. Its extent and exact direction are here unknown, but it is certain, that setting towards the N. W. part of Cuba, and striking on the banks of Isabella and Colorados, a portion of it winds round Cape Antonio to the south-eastward, while the great body of it sets eastward, to the northward of Cuba, winding to E. N. E., N. E., and N., through the Strait of Florida, into the Atlantic Ocean.

The Derrotero de las Antillas says, "By the Strait of Florida, we understand the space included between the meridian of the Dry Tortugas, and the parallel of Cape Canaveral. The simple inspection of the chart will show this to be a bed or course, which, like a river, conducts the water to the northward. This river, or general current, flows first to the E. N. E. as far as the meridian of the western part of the Double Shot Keys, by which keys the stream is diverted from E. N. E. to N. by E., the direction which it pursues on the parallel of Cape Florida: thence to Cape Canaveral it runs north, inclining a little to the east.

"On the meridian of the Havana, stripes of current are at times found setting to the E. S E. and S. E. from the Tortugas soundings. Care should be taken not to confuse the southern differences, caused by this branch of the current, with those caused by the eddy current near the Colorados—the one giving eastern departure, the other west. The distinction is very clear, and can admit of no doubt, because the eddy current is met only from the meridians of Cavanas and Bay Honda to Cape Antonio, and not farther out from the coast than the parallel of 23 degrees.

"As the velocity of the current varies, it is requisite for every navigator to ascertain its strength as frequently as possible, while within the stream. Every one who enters this channel, having marked well either the lands of Cuba or the Florida Reef, so as accurately to establish this point of departure, ought to determine in his first day's work, the velocity of the current by the difference of latitude, by account and observation. We say during the first day's work, because the generality of common navigators make use of meridian altitudes of the sun alone, to find the latitude; but it is very clear, that *altitudes of the planets and fixed stars ought not to be neglected; not only because by this you cannot be in doubt of your real latitude, but also because they may be more exact than latitudes deduced from meridian altitudes of the sun, when that luminary passes in the proximity of the zenith, and because these repeated observations during the night assume, as much as possible, the situation of the ship.* Thus you may go on, with a clear idea of the operation of the current, and the way that the ship is making. Having ascertained the velocity of the current, use can be made of it to find the ship's departure, and this knowledge will be most important when you fail in obtaining observations for latitude; because, in such a case, wanting a knowledge of the difference of latitude given by the current, you will be in want of every thing; but if you know the velocity of the current, and with it the course which it follows, you may find the difference of latitude and departure which the current gives, and which, though it will not give the position of the ship with that precision with which it might be obtained by latitude observed, will still approximate sufficiently to the truth to enable one to avoid danger, if prudence and seaman-like conduct are combined."

For those who have little experience in the art of navigation, we add—

1. That it is most convenient to direct your course in mid-channel, not only because it is the farthest from danger, but because you will there have the strongest current, which is desirable. (See Remarks of Mr. Romans on the Gulf Stream.)

2. That, as you cannot ascertain with all necessary certainty the position of the ship, notwithstanding the rules given to diminish the errors occasioned by the currents, you

ought, with the utmost care, to shun the eastern coast of Florida, as being very dangerous, the trade wind blowing upon it, while there is not the least risk in running along the Salt Key Bank, and the edge of the Great Bank of Bahama. Upon the latter, also you meet with good anchorages, very fit to lie in during the hard northerly gales experienced between November and March, and which do not fail to cause much damage, and sometimes even force vessels to bear away, which is always dangerous, for the weather is generally thick, with such winds, and the greatest danger will be to run, in one of them, ashore upon the coast of Cuba, when hoping to have made Havana or Matanzas. Therefore, so soon as there is an appearance of a northerly gale, the best way is, if near the Salt Key Bank, to anchor on it; and if near the Great Bank, to approach the edge of it, in order to be able to anchor when it may be necessary; for, although you may have a hard norther, so long as you can lie to in it, you ought to pursue your voyage, as the current will certainly carry the ship through the strait.

3. It is very necessary to sight the keys on the bank, even though you have no fear of a norther, and there may be occasions in which every exertion should be made to see them, especially if, from want of observations, the situation of the ship is not well known.

4. When, owing to calms or light winds, a vessel not bound to the northward is in danger of being carried through the strait by the current, she ought immediately to approach the edge of the Salt Key Bank, or of the Great Bahama Bank, and return from thence by the Santaren Channel to the coast of Cuba, without trying to beat back the lost ground; for by doing this, she would only render the chance of being carried through more certain.

5. Should you involuntarily approach the coast of Florida, you should take extraordinary care to examine whether you have advanced out of the general current, and into the eddy. That you may know this, observe the eddy forms a remarkable and visible line between it and the general current, which line of division is, in many places, out of sight of land; that in general you have no soundings on it, and that it shows, not only by the change in the color of the water, but that also in it, during the greatest calms, there is a kind of boiling or overfalling of the water. From this line of division the water gradually changes color, so that near the Florida Keys it is a beautiful sea green, and at last it becomes almost as white as milk.

6. When in the eddy, you have to make the correction of currents on courses entirely different from those in the stream. This is the more necessary to be attended to, because, from ignorance of this circumstance, many have been shipwrecked.

7. When you enter the channel, or strait, from the Tortugas Bank, with the intention of passing through, take care to become certain of the land of Cuba, or some part of the Reef of Florida, in order to have a good departure; for although the latitudes and soundings on the Tortugas Bank are more than sufficient to ascertain the place of the ship, yet the variable set of the current toward the Havana may produce a serious error, if not properly attended to. The meridian of the Havana is, in a word, the best point of departure for ships bound to the north-eastward.

At about 3½ degrees north of Cape Antonio, the current has at times been found setting to the S. W., winding towards the northern edge of the Yucatan Bank; but at a degree thence eastward, setting nearly S. E. Off the west end of Cuba, at 10 leagues N. W. from Cape St. Antonio, it has been found setting S. W. by W. one mile an hour. But these cannot be considered as its "general directions."

The stream in mid-channel, on the meridian of Havana, acquires the direction of E. N. E., and velocity of about 2½ miles an hour. On the meridian of the southernmost point of Florida, its velocity, at about one-third over from the Florida Reefs, is commonly 4 miles. Between the Bemini Isles and Cape Florida, its direction is about N. by E., and velocity more than 4 miles.*

On the Cuba side the stream is weak, and it sets to the eastward. On the opposite side, along the Florida Reefs and Keys, there is a re-flow or counter current, setting to the S. W. and W. By the assistance of the latter, many small vessels have navigated through the strait from the northward; but this navigation is too dangerous to be attempted by strangers. The tides set strong among these reefs, and are more particularly described in this work.

The winds are found to affect the position of the stream considerably. Between Cuba and Florida northerly winds press it southward towards the shore of the former; southerly winds have a contrary effect. When turned to the north, easterly winds press it to the Florida side, and westerly winds nearer to the Bahamas. Southerly winds cause it to spread, and so may those from the north.

In the Strait of Florida, within the Bahamas, when a northerly gale increases to a

* "The calculations of the velocity of the Gulf Stream are not to be depended upon. I have found it setting at the rate of 5 knots, and even upwards. This was on the 16th and 17th of August, 1817. On the 19th and 20th of February, 1819, it seemed to be imperceptible. In September, 1819, it set at much about the rate described in the charts."

storm, it opposes the stream in its course, though adverse power causes it to fill all the channels and openings among the Martyr Isles and Reefs, and to overflow all the low coast. Shipping have even been carried over the low keys, and left dry on shore.* The water is supposed at times to have risen to the height of 30 feet, and to have been running against the fury of the winds at the rate of 7 miles an hour. During these times the Strait of Florida exhibits a scene terrific beyond description.

Remarks on the Stream, &c., by Captain J. Steele Park.

"Sailed from Jamaica for London, on the 20th May, 1824. At noon, on the 27th, was off the S. W. side of Cuba, in latitude 21° 26′, longitude by chronometers and lunars 84° 47′ W. Here was discovered a current setting to the N. W. at the rate of two miles an hour. At 7h. 30m. Cape Antonio bore N. W., 5 or 6 miles. The current to the N. W.," says Capt. Park, "swept us into the Gulf of Mexico; and there we were beating about three or four days, making northing and westing in spite of our teeth. All this time the wind was easterly, and we might have cruised about there till Christmas, had the wind not got a little to the southward of east, which enabled us to get over to the N. E. side, where we found the current running directly opposite to the former, being now in the Florida stream.

"After rounding Cape Antonio the land of Cuba was not seen. At this time, (the latter days of May, 1824,) the stream along the Florida side, and even in the strait, was by no means so strong as it is generally found. In the narrowest part, where, of course, we had a right to expect the greatest velocity, it was running at the rate of only 2½ miles in the hour. This was correctly ascertained by meridian altitudes of sun and moon, and an excellent chronometer.

"When we cleared the Gulf," (Strait) Capt. Park adds, "I was anxious to keep in the influence of the stream, and pass near the Tail of the Bank of Newfoundland, but it came on to blow hard from the northward, in latitude 34° 35′, and longitude 72° 20′ (E. by S. from Cape Hatteras.†) This, of course, drove us away to the eastward, out of the favorite track, and we passed about 300 miles to the northward of the Bermudas. During this gale, for several days a current was found to proceed from the eastward to the W. S. W., but in latitude 38° and longitude about 59°, the ship was in the Gulf Stream, setting finely to the N. E.

"On June 23d, at noon, lat. 37° 51′, long. 61° 54′; June 24th, lat. 39° 56′, long. 57° 26′ (by altitudes and chronometer.) Here the ship really made 4° 28′ of easting in the 24 hours run, and the log gave only 3° 16′. In the same time northing was made. The true difference of latitude was 125 minutes, but the log gave about 80 only. The vessel had been running all the time E. by N., by compass, and went through the water 173 miles. Allowing half a point of variation, gives the true course N. E. by E. ½ E. Subsequently, on making Scilly, there was not an error in the watch of a single mile.

"After the gale from the northward subsided, the winds became variable between N. W. and S. W. The ship passed near the Tail of the Great Bank, and continued to carry a fine north-easterly current, at the rate of 30, 25, and 20 miles a day, until she reached lat. 43° 35′ and long. 36° 50′, where it ceased.

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*In the month of September, 1769, there happened an inundation, which covered the tops of the highest trees on the Cayo Larga, &c., and during which the Ledbury Snow, John Lorain, master, was carried over the reef by the N. W. current of the stream, caused by a gale from N. E. The vessel bilged in shallow water, but an anchor was thrown out, and the next day the vessel was found to have grounded on Elliot's Key, with its anchor among the trees.—[De Braham's Atlantic Pilot.]

†A scientific navigator says, "When in the Gulf, eastward of Hatteras, I generally endeavor to get out of it as early as possible, especially with a strong N. E. wind, for I think the advantage of the current will not compensate for the effects of the destructive sea and squally weather, which generally attend that part of the ocean."

Currents from the Bay of Honduras, and thence through the Strait of Florida, as observed by Capt. W. J. Capes, in Jan. 1824.

Jan.	16	Lat. 17°	55′	Long. 87°	30′	Current 16	miles	southerly in the 24 hours.
"	17	18	24	87	8	14	do.	do.
"	18	18	14	86	35	16	do.	do.
"	19	19	31	85	58	5	do.	northward.
"	20	20	6	85	17	6	do.	do.
"	21	20	47	85	39	5	do.	do and 20 eastward.
"	22	22	9	85	44	29	do.	northward.
"	23	23	13	84	8	11	do.	do.
"	24	23	22	82	42			no current.
"	25	24	47	80	10	9	miles	northward, and 55 eastward.
"	26	26	52	79	54	49	do.	northward.
"	27	28	22	79	50	29	do.	do.
"	28	30	0	78	34	37	do.	do.
"	29	30	31	76	7	24	do.	do.

From the S. W. corner of the Tortugas Bank, the current has, at times, been found to set S. S. W. directly over to the Colorados. But between the Tortugas and Bahia Honda, or Port Cavanas, it takes its regular set to the eastward.

The boisterous east, N. E., and N. winds, which affect the Gulf Stream, generally begin in September, and continue until March.

On the southern edge of the Tortugas Soundings, lat. 24° 30′, long. 83° 30′, the current sets about E. by S. 20 miles in the 24 hours; and in lat. 24°, long. 82° 20′, it sets about E. by N. 42 miles.

Remarks on the Stream, by Captain W. J. Monteath.

Between latitude 25° 40′ and 28° 20′, Captain Monteath found the current in the Strait had set 80 miles in the 24 hours of June 27, 1820. On the southern border of the stream, (northward of the parallel of Cape Hatteras,) 6th July, 1820, lat. 35° 20′ to 36° 30′, long. 72° 30′ to 71° 3′, Captain M. found the current setting N. E. 75 miles in the 24 hours. Next day, July 7, to lat 37° 40′, long. 69°, he found it N. 53° E. 86 miles in 24 hours. On the following day, July 8, to lat 38° 38′, long. 67°, it ran N. 58° E. 30 miles. July 9, to lat. 39° 10′, long. 66° 10′ westward, only 10 miles. The observations were continued each day by Chronometer, which agreed within a few miles.

The stream, from lat. 26° to 28°, generally sets north, rather easterly; from 28° to about 31°, it appears to run north, inclining a little in the direction of the coast, rather westerly; it thence suddenly turns to the N. E. by E., or a little more easterly, to latitude 35°, or about the parallel of Cape Hatteras, where it runs within about 18 miles of the Cape.

The stream, in the neighborhood of the coast at Cape Hatteras, inclines more to the eastward, at the rate of about 2½ knots; then the shoals of Nantucket appear to front it, and to throw it off to the E. N. E. and E. by N. northerly. In about the parallel of 39½°, longitude 63½°, it has been found to run at the rate of two knots between E. by N. and E. N. E.

Col. Williams, in his "Thermometrical Navigation," states that the whirlpools on the northern edge of the stream, have been seen in lat. 41° 57′, long 65° 1′. He also observed great quantities of weed, supposed to be on the northern edge of the stream in latitude 41° 53′. long. 65° 33′. It has subsequently been ascertained by Lieut. Charles Hare, R. N., that on the meridian of 57° W. in the summer season, the northern edge of the stream ranges up to 42¾° N., and even in the winter months to above 42° N. This has been confirmed by twenty-five voyages across the Atlantic, assisted by chronometer, thermometer, &c., the last of which was made in the fall of the year 1824.

It is, however, to be considered, that a north, N. E. or east wind forces the stream towards the coast, contracts its breadth, and thus increases its rapidity. On the contrary, S. W., west, and N. W. winds, force the stream farther into the ocean, and diminishes its strength.* It is clear, then, that the stream fluctuates in its direction and

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* An experienced navigator, before quoted, says "It is always found that the strongest current is in the warmest water. I have observed the greatest degree of heat of the Gulf, between the meridian of Cape Hatteras and that of Nantucket, to vary at different times from 75° to 67° of Fahrenheit, and the strongest current to differ from 3 to 1½ miles per hour; that the breadth of the stream current is much less than is generally supposed, and that the winds cause a great effect on the Gulf; for instance, a wind that would produce a current of one knot, would retard one of 3 knots to 2 knots if opposed to it; and would accelerate the same to 4 knots, if in the same direction; and that a wind crossing a current obliquely, would affect it as the sine of the angle at which it is opposed. The direction of a current cannot, however, be materially changed, when forced against an opposing barrier."

force, according to circumstances, and no absolute rule can be given for ascertaining its more ordinary boundaries; it therefore follows, that a description of the indications by which it may be known, is of more importance. These are, the appearance and temperature of the water; the stream, in its lower latitudes, and usual course in fair weather, where it flows uninterruptedly, may be known by its smooth and clear surface, and blue color. The margin of the stream is marked by a ripple on its edge; the water in some places appears like boiling water; and in other places, it foams like the waters of a cataract, even in dead calms, and in places which are fathomless; *and during strong N. E. winds, that part from Cape Roman to the north and east breaks violently, so much so that it has been mistaken for shoals during the night.*

On the outer edge of the stream, especially in fair weather, there are great ripplings, which are very perceptible; and it has been observed, by many navigators, that in the Gulf the water does not sparkle in the night, *but with south-easterly winds it does as much as in other parts of the ocean.* The appearance of the weed called Gulf-weed is also an indication of being in or near the stream, as it is never seen far north of it.

By the advantage of knowing how near to the coast a ship may venture, and how to distinguish the Gulf Stream from the water between it and the coast, we can be sure of a favorable current either way; and a small vessel might make a short voyage from Halifax to Georgia, which is thought by some a longer one than to Europe. Suppose you had the wind a-head all the way: take your departure and stand for the stream: so soon as you find the water to increase in heat about half as much as you know it would when in the stream, heave about and stand for the coast; you will infallibly discover the edge of soundings by the cooling of the water; then stand off again, and so on to the end of the voyage; when it is almost certain, that the distance would be run in a shorter time than if there were no stream, for you would have a favorable inside current. On the return passage, take your departure, and run off till you get into the warmest water, which will be the middle of the stream, and take the advantage of its currents.

The following fact may serve to illustrate the propriety of these directions. In June, 1798, the Mail-Packet for Charleston, had 25 days' passage in going, but returned in 7. The captain accounted for this by having calms, or very light airs and a northerly current. This was the true cause. He was in the middle of the stream, where there generally are calms or light winds; the edges only, which come in contact with colder regions being tempestuous. After being in the latitude of Cape Hatteras, he found himself in that of Cape Henry, (37 leagues to the northward.) The vessel, however, arrived at last; and on the return voyage, the captain steered the same course back again; and, with the same light airs, he performed the voyage in 7 days. Had this captain known the use of the thermometer, need he to have been much longer in going than in coming?

The thermometer is not only useful for ascertaining when in the Gulf Stream, but it is likewise advantageous in discovering the approach to soundings on the Coast of North America between Cape Canaveral and the Island of Newfoundland.

In June, 1791, Captain W. Billings, of Philadelphia, in latitude 39° long. 56°, abreast of the Bank of Newfoundland, found that the mercury in the thermometer fell 10 degrees. It was near the same place that a similar observation was made by Dr. Franklin, in November, 1776, and another by Mr. Williams, in November, 1789, who has observed that, "by the coincidence of these three journals, at so great a distance of time, and without any connexion with each other, this important fact seems to be established: *A navigator may discover his approach towards objects of danger, when he is at such a distance as to be able easily to avoid them, by attentively examining the temperature of the sea,* the water over banks and shoals being colder than that of the deep ocean."

Others, also entitled to credit, believe the thermometer only indicates the difference of temperature caused by going into or leaving the Gulf Stream, on the principle that its temperature is influenced and governed entirely by the fact that it comes from the Tropical regions, where the mean temperature is 82°, and it requires a long time before so large a body of water loses or changes its temperature in a very great degree.

At the edge of the grand Bank of Newfoundland, the water has been found 5 degrees colder than the deep ocean to the eastward. The highest part of the bank is 10 deg. colder still, or 15 deg. colder than the ocean eastward.

On the coast of New England, near Cape Cod,* the water out of soundings is 8 or 10 degrees warmer than in soundings; and in the stream it is about 8 degrees warmer still, so that, in coming from the eastward, a fall of 8 degrees will indicate your leaving the stream, and a farther fall of 8 degrees will indicate your being on soundings.

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* The bank, from Cape Cod, extends almost as far as Cape Sable, where it joins the banks of Nova Scotia, deepening gradually from 20 to 50 or 55 fathoms, which depth there is in latitude 43°. In crossing the bank between lat. 40° 41′ and lat. 43′, the bottom is very remarkable. On the outside it is fine sand, shoaling gradually for several leagues. On the middle of the bank, it is coarse sand or shingle, with pebble stones. On the inside it is muddy, with pieces of shells, and deepens suddenly from 45 or 48 to 150 or 160 fathoms.

On the coast from Cape Henlopen to Cape Henry, the water out of soundings is 5 degrees warmer than in soundings; and in the stream about 5 degrees warmer still; so that, in coming from the eastward, a fall of 5 degrees will indicate your leaving the stream, and a farther fall of 5 degrees will give notice of soundings.

Mr. Williams recommends to seamen to take three thermometers. "Let them," he says, "be kept in one place some days previous to sailing, in order to try their uniformity. The plate should be made of ivory or metal, for wood will swell at sea; and as the glass tube will not yield, it is from this reason very liable to break: bell metal is the best. Let the instrument be fixed in a square metal box, the bottom of which, as high as the mark 30°, should be water tight; so that, in examining the degree of heat, the ball may be kept in the water; the remainder of the length should be open in the front, with only two or three cross-bars to ward off any accidental blow, like the thermometer used by brewers. Fix one instrument in some part of the ship, in the shade, and in open air, but as much out of the wind, and in as dry a place as possible. The after part of one of the after stanchions, under the quarter rail, may answer, if no better place can be found.

Let the second instrument be neatly slung, with a sufficiency of line to allow it to tow in the dead water of the wake.

Put the other away safely, to be ready to supply the place of either of the others in case of accident.

About the edges of the stream there is generally a current running in a contrary direction, which is accelerated by the wind, in proportion to its strength, blowing contrary to the stream, and retarded, or perhaps altogether obstructed, by the wind blowing in the direction of the stream. In the latter case, the limits of the stream will be extended.

In the winter, when the cold upon the land is most intense, which is generally between December and March, heavy and continued gales very frequently prevail, which commonly proceed from between the north and west, across the course of the Gulf Stream, from Cape Hatteras until past George's Bank, and bend its direction more to the eastward; being aided at the same time by the discharge of the great bays and rivers, increased by the force of the wind blowing down upon them, and the constant supply of stream that passes along the coast of the Carolinas, the whole produces so strong a current to the eastward as to render it impossible for a ship to approach the coast until there is a change of wind.

During the prevalence of a southerly or easterly wind, which is not so common here, it has been found that the current is forced close to, and in some parts upon the soundings. From a scientific nautical gentleman, we received the following, viz., while off Cape Lookout, in 11 fathoms water, he had a strong current from the southward, owing entirely to the gulf current. This also proves the gulf influenced by winds. Being thus pent in between the wind and the shoal grounds near the shore, the breadth is greatly diminished, and the velocity proportionably increased. This circumstance has been, in particular, observed from about the longitude of Block Island, along the edges of Nantucket Shoals, thence beyond George's Bank; it has the same effect along the coast of Georgia and part of South Carolina. In the first place, the southerly winds forced the current to the edge of the soundings, where it then ran from 1½ to 2 knots; and, in the latter place, that the easterly wind forced the current upon soundings.

With west and N. W. winds, the stream would be removed some leagues farther off.

These remarks are sufficient to show the uncertainty of the boundaries or edges of the stream. These eddies on the inner edge are inconsiderable; but on the outer one, in fine weather, they are strong, and of considerable extent.

By an ingenious work, entitled "Thermometrical Navigation," written by Mr. John Williams, and published at Philadelphia, in 1799, we are informed that Commodore Truxton has often ascertained the velocity of the Gulf Stream, to the northward of Cape Hatteras, and found it to be seldom less than one knot, and never more than two knots, an hour. The temperature of the air and water without the stream was generally the same; that is, the difference seldom exceeded 2 or 3 degrees; the air being sometimes the warmest, at other times the water.

Capt. Livingston says, "it set me, off Cape Hatteras, one degree and eight miles, by sidereal and solar observations, to the northward, in 16 hours, by dead reckoning; and Capt. Joreal Coltast, of Philadelphia, informed me that it set occasionally with greater velocity."

Mr. Williams observes, "In the stream the water is much warmer than the air; indeed, I have known it 10 degrees warmer; but so soon as you get within the stream, (that is, between it and the coast,) the water becomes colder than the air; and the more as you get on soundings and approach the shore.* If mariners, who have not the op-

* By the journals of Capt. W. Billings, of Philadelphia, it appears that in June, 1791, the water on the coast of America was at the temperature of 61°, and in the Gulf Stream at 77°. By those

portunity of determining their longitude by celestial observations, will only *carry with them a good thermometer*, and try the temperature of the water, and compare it with that of the air every two hours, they may always know when they come into or go out of the Gulf Stream. Indeed, I have always made a practice, when at sea, of comparing the temperature of the air and water daily, and often very frequently during the day throughout my voyage; whereby I immediately discovered any thing of a current that way going, and afterwards found its strength and direction by observations for the latitude and longitude. It is of the utmost consequence, in making a passage to and from Europe, to be acquainted with this Gulf Stream; as by keeping it when bound eastward, you shorten your voyage, and by avoiding it when returning to the westward, you facilitate it inconceivably; so much so, that I have frequently, when bound from Europe to America, spoken European ships, unacquainted with the strength and extent of it, off the banks of Newfoundland, and been in port a very considerable time before them, by keeping out of the stream, whereas they lengthened their passage by keeping in it. The general course of the Gulf Stream is marked on the chart published by E. & G. W. Blunt, in 1832; and I would advise those who make the northern passage from Europe, never to come nearer the inner line of it, by choice, than 10 or 15 leagues; and then the probability will be, that their passage will be assisted by the help of a counter-current which often runs within it. In coming off a voyage from the southward, be sure to steer N. W. when approaching the stream, if the wind will permit you; and continue that course till you are within it, which may be easily known by the temperature of the water, as before mentioned. I have always considered it of the utmost consequence, when bound in, to cross the stream as speedily as possible, lest I should be visited by calms or adverse winds, and by these means drove far out of my way, which would prolong the voyage considerably, especially in the winter season.

The course of ships bound from Europe to the ports of the United States is controlled, in a great degree, by the operation of the Florida Stream. Little, therefore, requires to be added to the subject here. Those bound to the northern and middle ports, when passing the shoal grounds on George's Bank, should take care to pass between these shoals and the stream. Also, when passing the Nantucket Shoals, to keep between them and the stream. The south part of the most dangerous shoal on George's Bank is in latitude 41° 34′ N., and the shoals extend to latitude 41° 53′ 30″ N., and that of Nantucket South Shoal in latitude 41° 4′. N.

Ships crossing the stream, when bound to the westward, must get over as quickly as possible; or it is clear that they will be carried far out of their course.*

It has been remarked that "ships from sea, approaching any part of the American coast between Long Island and Cape Hatteras, if in doubt about their reckoning, should take notice of what is commonly called the gulf-weed, which is in greater plenty, and in larger clusters, to the eastward of the Gulf Stream than in it, where the sprigs are but small and few. Within the stream there is no weed, unless in rare instances, and there the color of the water changes to a still darker and muddy color.

The outer edge of the bank off this part of the coast appears to be very steep; for it has been frequently found that, while the lead has been kept going, there have been

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of Mr. J. Williams, it appears that in November, 1789, the water on the coast was 74°, and in the Gulf Stream at 70°, viz.:

1791, June, Coast	61°	1789, Nov., Coast	47°	Difference between June and Nov.	Coast 14°
Stream	77	Stream	70		Stream 7
Stream warmer	16	Stream warmer	23		

The difference of heat is therefore greater in winter than in summer. See the concluding observation hereafter, and also the pamphlet published with "Blunt's Chart of the Western Ocean," which contains all the remarks of Mr. Williams on the subject.

Captain A. Livingston says, "On my voyage from Philadelphia to Kingston, Jamaica, October, 1817, I particularly attended to the thermometer. Close off the mouth of the Delaware, in about 16 fathoms, it stood at 60°; on the inner edge of the Gulf Stream it rose pretty rapidly to 66°, and in the course of an hour to 76°; next morning 78°, which heat continued till we were to the southward of Bermuda, whence it gradually increased until between Cuba and St. Domingo, and at Jamaica it was 82°, which appears to me to be the mean temperature of the sea water about Jamaica.

* The following notice, relative to several short passages across the Atlantic, was given in a Liverpool paper, January, 1824, and affords a pleasing demonstration of improved knowledge in the navigation of this ocean:

"The packet ship New York, Capt. Thomas Bennet, arrived here on Thursday last, after one of the shortest passages we believe yet made between New York and this port. She sailed on the 16th of December, and arrived here in the morning of the 1st January, being little more than 15 days. The Mary Catherine, which left Charleston on the 16th of December, made her voyage from port to port in 19 days. The Marmion arrived in the evening of the 7th January, in 18 days from Charleston, and two more from that town."

found 45 fathoms, soon after 35, and a mile nearer the shore only 25 or 20 fathoms; from these depths the shoaling to the shore varies in different directions.

Sir Charles Blagden, M. D. and F. R. S., in the transactions of the Philosophical Society, says, "During a voyage to America, in the spring of the year 1776, I used frequently to examine the heat of sea water newly drawn, in order to compare it with that of the air. We made our passage far to the southward. In this situation, the greatest heat of the water, which I observed, was such as raised the quicksilver in Fahrenheit's thermometer to 77½°. This happened twice; the first time, on the 10th of April, in lat. 21° 10′ N., and long., by reckoning, 52° W., and the second time, three days afterwards, in lat. 22° 7′, and long. 55°; but in general, the heat of the sea, near the tropic of Cancer, about the middle of April, was from 76° to 77°.

"The rendezvous appointed for the fleet being off Cape Fear, our course, on approaching the American coast, became north-westward. On the 23d of April, the heat of the sea was 74°, our latitude, at noon, 28° 7′ N. Next day the heat was only 71°; we were then in latitude 29° 12′; the heat of the water, therefore, was now lessening very fast, in proportion to the change of latitude. The 25th, our latitude was 31° 3′; but though we had thus gone almost 2° farther to the northward, the heat of the sea was this day increased, it being 72° in the morning, and 72½° in the evening. Next day, 26th of April, at half past 8 in the morning, I again plunged the thermometer into sea water, and was greatly surprised to see the quicksilver rise to 78°, higher than I had ever observed it even within the tropic. As the difference was too great to be imputed to any accidental variation, I immediately conceived that we must have come into the Gulf Stream, the water of which still retained great part of the heat that it had acquired in the torrid zone. This idea was confirmed by the subsequent regular and quick diminution of the heat; the ship's run for a quarter of an hour had lessened it 2°, the thermometer, at three-quarters after 8, being raised by sea water, fresh drawn, only to 76°; by 9, the heat was reduced to 73°; and in a quarter of an hour more, to 71° nearly: all this time the wind blew fresh, and we were going seven knots an hour on a north-western course. The water now began to lose the fine transparent blue color of the ocean, and to assume something of a greenish olive tinge, a well known indication of soundings. Accordingly, between 4 and 5 in the afternoon, ground was struck with the lead, at the depth of 80 fathoms, the heat of the sea being then reduced to 69°. In the course of the following night and next day, as we came into shallower water, and nearer the land, the temperature of the sea gradually fell to 65°, which was nearly that of the air at the time.

Unfortunately, bad weather on the 26th prevented us from taking an observation of the sun; but on the 27th, though it was then cloudy at noon, we calculated the latitude from two altitudes, and found it to be 33° 26′ N. The difference of this latitude from that which we had observed on the 25th, being 2° 23′, was so much greater than could be deduced from the ship's run, marked in the log book, as to convince the seamen that we had been set many miles to the northward by the current.

"On the 25th, at noon, the longitude by our reckoning was 74° W., and I believe the computation to have been pretty just; but the soundings, together with the latitude, will determine the spot where these observations were made, better than any reckoning from the eastward. The ship's run on the 26th, from 9 in the forenoon to 4 in the afternoon, was about 10 leagues on a N. W. by N. course; soon afterwards we hove to in order to sound, and finding bottom, we went very slowly all night, till noon the next day.

"From these observations, I think it may be concluded that the Gulf Stream, about the 33d degree of north latitude, and the 76th degree of longitude west of Greenwich, is, in the month of April, at least 6 degrees hotter than the water of the sea through which it runs. As the heat of the sea water evidently began to increase in the evening of the 25th, and as the observations show that we were getting out of the current when I first tried the heat in the morning of the 26th, it is most probable that the ship's run during the night is nearly the breadth of the stream, measured obliquely across; that as it blew a fresh breeze, could not be less than 25 leagues in 15 hours, the distance of time between the two observations of the heat, and hence the breadth of the stream may be estimated at 20 leagues. The breadth of the Gulf of Florida, which evidently bounds the stream of its origin, appears by the charts to be 2 or 3 miles less than this, excluding the rocks and sand-banks which surround the Bahama Islands, and the shallow water that extends to a considerable distance from the coast of Florida; and the correspondence of these measures is very remarkable, since the stream, from well known principles of hydraulics, must gradually become wider as it gets to a greater distance from the channel by which it issues.

"If the heat of the Gulf of Mexico were known, many curious calculations might be formed by comparing it with that of the current. The mean heat of Spanish Town and Kingston, in Jamaica, seems not to exceed 81°;* that of St. Domingo, on the sea coast,

* History of Jamaica, London, 1774, vol. iii. page 652, 653. The different observations of the heat recorded in that work, do not agree together, but those adopted here are taken from that series which appeared to me most correct.

may be estimated at the same, from Mons. Godin's observations;* but as the coast of the continent, which bounds the gulf to the westward and southward, is probably warmer, perhaps a degree or two may be allowed for the mean temperature of the climate over the whole bay; let it be stated at 82 or 83 degrees. Now there seems to be great probability in the supposition that the sea, at a certain comparatively small distance below its surface, agrees in heat pretty nearly with the average temperature of the air, during the whole year, in that part; and hence it may be conjectured that the greatest heat of the water, as it issues out of the bay to form the stream, is about 82 degrees,† the small variation of temperature on the surface not being sufficient to effect materially that of the general mass. At the tropic of Cancer, I found the heat to be 77°; the stream, therefore, in its whole course from the Gulf of Florida, may be supposed to have been constantly running through water from 4 to 6 degrees colder than itself, and yet it had lost only 4° of heat, though the surrounding water, where I observed it, was 10° below the supposed original temperature of the water which forms the current. From this small diminution of the heat, in a distance of probably 300 miles, some idea may be acquired of the vast body of fluid which sets out from the Gulf of Mexico, and of the great velocity of its motion. Numerous observations of the temperature of this stream, in every part of it, and at different seasons of the year, compared with the heat of the water in the surrounding seas, both within and without the tropic, would, I apprehend, be the best means of ascertaining its nature, and determining every material circumstance of its movement, especially if the effect of the current, in pushing ships to the northward, is carefully attended to, at the same time with the observations upon its heat."

On the 25th September, 1777, as the ships which had transported Sir William How's army up Chesapeake Bay were returning towards the Delaware, with the sick and stores, they were overtaken, between Cape Charles and Cape Henlopen, by a violent gale of wind, which, after some variation, fixed ultimately at N. N. E., and continued 5 days without intermission. It blew so hard that they were constantly losing ground, and driven to the southward. We also purposely made some easting, to keep clear of the dangerous shoals which lie off Cape Hatteras.

On the 28th, at noon, our latitude was 36° 40′ N., and the heat of the sea, all day, about 65°. On the 29th our latitude was 36° 2′. We had, therefore, in the course of these 24 hours, been driven by the wind 38 nautical miles to the southward. The temperature of the sea continued nearly at 65°. Next day, the 30th, our latitude, at noon, was 35° 44″, only 18 miles farther to the southward, though in the opinion of the seamen aboard, as well as my own, it had blown at least as hard on this as on any of the preceding days, and we had not been able to carry more sail; consequently it may be concluded that some current had set the ship 20 miles to the northward. To know whether this was the Gulf Stream, let us consult the thermometer. At half past nine in the forenoon of this day, the heat of the water was 76°, no less than 11° above the temperature of the sea, before we came into the current.

Towards evening the wind fell, and we stood N. W. by N., close hauled. As the sea still ran very high, and the ship scarcely went above two knots an hour, we did not make less than three points of leeway on this tack. The course we made good, therefore, was W. N. W., which on the distance run by noon next day, gave us about 16 miles of northing; but that day, the 1st of October, our latitude was 36° 22′, 38 miles farther to the north than we had been the day before; the difference, 22 miles, must be attributed to the Gulf Stream. This, however, is only part of the effect which the current would have produced upon the ship, if we had continued in it the whole 24 hours; for though we were still in the stream at five in the afternoon of the 30th, as appeared by the heat of the water, being then above 75°, and at eight in the evening the heat being still 74°, yet by seven the next morning we had certainly got clear of it, the heat of the sea being then reduced to its former standard of 65°. On this occasion, therefore, we did not cross the stream, but, having fallen in with it obliquely on the western side, we pushed out again on the same side, as soon as the gale abated.

These observations having been made 3° to the northward of my former ones, it is

* Monsier Godin's experiments upon the pendulum were made at the petit grove. They continued from the 24th of August to the 4th of September, and the average heat during that time was such as is indicated by 25° of M. de Reaumer's thermometer, (see Mem. Acad. Science, 1735, p. 5. 7.) According to M. de Luc's calculation, (see Modifications de l'Atmosphere, vol. i. p. 378,) the 25th degree of Reaumer's *true* thermometer answers to about the 85th of Fahrenheit's; but the average heat in Jamaica, during the months of August and September, is also 85°; hence we may conclude that the mean heat for the whole year is nearly the same on the sea coasts of both islands.

† The lowest calculation of the mean temperature of the gulf is preferred on this occasion, because of the constant influx of new water from the Atlantic Ocean, produced by the trade winds, which water, not having been near any land, must, I think, be sensibly colder than that which has remained some time enclosed in the bay. On this subject, the observations made by Alexander Dalrymple, Esq., relative to the heat of the sea, near the coast of Guinea, ought to be consulted.— (See Phil. Trans. vol. lxviii. p. 394, &c.)

curious to observe that the heat of the Gulf Stream was 2° less. The seasons of the year, indeed, were very difficult; but, perhaps under such circumstances, that their effects were nearly balanced. In the latter observations, the meridian altitude of the sun was less, but then a hot summer preceded them; whereas in the former, though the sun's power was become very great, yet the winter had been passed but a short time. Calculating upon this proportion, we may be led to suspect, that about the 27th degree of latitude, which is as soon as the stream has got clear of the Gulf of Florida, it begins sensibly to lose its heat from 82°, the supposed temperature of the Gulf of Mexico, and continues to lose it at the rate of about 2° of Fahrenheit's scale to every 3° of latitude, with some variation, probably, as the surrounding sea and the air are warmer or colder at different seasons of the year.

The preceding facts had made me very desirous of observing the heat of the Gulf Stream on my passage homeward, but a violent gale of wind, which came on two days after we had sailed from Sandy Hook, disabled every person on board, who new how to handle a thermometer, from keeping the deck. The master of the ship, however, an intelligent man, to whom I had communicated my views, assured me, that on the second day of the gale, the water felt to him remarkably warm; we were then near the 70th degree of west longitude. This agrees very well with the common remark of seamen, who allege that they are frequently sensible of the Gulf Stream off Nantucket Shoals, a distance of more than 1000 miles from the Gulf of Florida! According to the calculation I have before adopted, of a loss of 2° of heat of every 3° of latitude, the temperature of the Gulf Stream here would be nearly 73°, the difference of which from 59°, the heat that I observed in the sea water, both before and after the gale, might easily be perceived by the master of the vessel. This was in the winter season, at the end of December.

An opinion prevails among seamen, that there is something peculiar in the weather about the Gulf Stream. As far as I could judge, the heat of the air was considerably increased by it, as might be expected, but whether to a degree or extent sufficient for producing any material changes in the atmosphere, must be determined by future observations.

Perhaps other currents may be found, which, issuing from places warmer or colder than the surrounding sea, differ from it in their temperature so much as to be discovered by the thermometer. Should there be many such, this instrument will come to be ranked amongst the most valuable at sea, as the difficulty of ascertaining currents is well known to be one of the greatest defects in the present art of navigation.

In the mean time, I hope the observations which have been here related are sufficient to prove that in crossing the Gulf Stream, very essential advantages may be derived from the use of the thermometer; for if a master of a ship, bound to any of the southern provinces of North America will be careful to try the heat of the sea frequently, he must discover very accurately his entrance into the Gulf Stream by the sudden increase of the heat; and a continuance of the same experiments will show him, with equal exactness, how long he remains in it. Hence he will always be able to make a proper allowance for the number of miles a ship is set to the northward, by multiplying the time into the velocity of the current. Though this velocity is hitherto very imperfectly known from want of some method of determining how long the current acted upon the ship, yet all uncertainty arising from thence must soon cease, as a few experiments upon the heat of the stream, compared with the ship's run, checked by observations of the latitude, will ascertain its motion with sufficient precision. From differences in the wind, and perhaps other circumstances, it is probable that there may be some variations in the velocity of the currrent; and it will be curious to observe whether these variations may not frequently be pointed out by a difference in its temperature, as the quicker the current moves, the less heat is likely to be lost, and consequently the hotter will the water be. In this observation, however, the season of the year must always be considered, partly because it may perhaps in some degree affect the original temperature of the water in the Gulf of Mexico, but principally because the actual heat of the stream must be greater or less, in proportion as the tract of the sea through which it has flown, was warmer or colder. In winter I shall suppose that the heat of the stream itself would be rather less than in summer, but that the difference between it and the surrounding sea would be much greater; and I conceive that in the middle of summer, though the stream had lost very little of its original heat, yet the sea might, in some parts, acquire nearly the same temperature, so as to render it scarcely possible to distinguish by the thermometer when a ship entered into the current.

Vessels may with safety avoid the eddy of the gulf, or make allowance for it in their calculations; that is, if they cannot help falling into them, after they have taken all the precautions by soundings in blue water, and when they had bottom, stood off, they will naturally subtract what longitude they make in the eddy, from what they had made in the stream, and begin a new departure, being at the same time very precise in their morning and meridian observations. Many ships bound through the Strait of Florida, unac-

quainted with the stream's eddy, and ignorant also of the soundings being under blue water, have been lost in fair weather. They were swept insensibly by the eddy to the westward, and when they found by their calculations that they had a sufficient offing east of Cape Florida, they stood north, and instead of entering the strait, ran directly upon a reef.

If with adverse northerly, easterly, or N. E. winds, vessels happen to be in the mouth of the Gulf of Mexico, that is, between the Havana and Cape Florida, they had best endeavor to make the Bahama Islands, or at least the soundings of them, and proceed under the lee side; but when they are to the north of them, it is best to keep in the eastern extent of the stream, or else they will not be able to clear their way through the strait, nor along the coast of East Florida, and may get on shore upon the reefs either of Cape Florida or Cape Canaveral, if not upon the beach between the two capes, which is the least evil of the two; for thus the crew and cargo may be saved; and some vessels may also be brought off, provided the storm ceases before the vessel is made a wreck of. But if at any time of the south sun, or at any other time, the winds are westwardly, then the Atlantic coast affords the most eligible lee for navigators who do not choose to take the stream; but if the current in the gulf is well understood, it will greatly facilitate the progress, when bound to the northward.

Speaking of the GULF STREAM, Mr. Romans,* whose surveys of the coast of Florida reflected great credit on him, says: "The All-gracious Ruler of the Universe, has so disposed the several shores of this mazy labyrinth, as to cause this current to run in a direction N. E. and at the rate of 3, and 3½ miles in an hour; by which means we are enabled better to avoid the imminent dangers of the reef, where it becomes a lee shore; for the violence of the easterly gales beats the Gulf-water over the reefs, so as to destroy the effect of flood-tides, by causing a constant reverberating current from the shore over the reef, insomuch that a vessel riding under the reef will lay with her stern to windward.

"I once came out from Matacumbe, and was scarcely clear of the reef, before I was overtaken by a gale from the eastward, which was very violent. It was 5 o'clock in the evening, and it being dark, to attempt a re-entrance of the reef, I was forced to heave the vessel to, which I did under the balanced mainsail; she was a heavy schooner of about 70 tons, and a dull sailer. The succeeding night I passed in the deepest distress of mind, seeing the burning of the breakers in constant succession on the reef, till past one o'clock; the storm continued till ten next morning, when I made sail to the northward, and at noon, to my utter astonishment, I had an observation of the sun's altitude, which proved me to be in 26° 50′ latitude, by which I had made a difference of latitude of 118 miles, in the short space of 19 hours, 17 of which I lay to.

"I am an utter enemy (continues Mr. Romans,) to all theoretic and systematic positions, which has caused in me an indefatigable thirst for finding, in my experience, causes for all extraordinary appearances, be they what they may. And my experimental position of the cause of the increase of the velocity of this current, during the gales, that blow contrary to its direction, is no other than the reverberating current occasioned by the swelling of the water within the reef, which in the memorable gale of October, 1769, when the Ledbury was lost, was no less than 30 feet above its ordinary level."

Besides the convenience of correcting a ship's course, by knowing how to make a proper allowance for the distance she is set to the northward by the current, a method of determining with certainty when she enters into the Gulf Stream, is attended with the farther inestimable advantage of showing her place upon the ocean in the most critical situation; for, as the current sets along the coast of America, at places on soundings, the mariner when he finds this sudden increase of heat in the sea, will be warned of his approach to the coast, and will thus have timely notice to take the necessary precau-

* Mr. Romans observes, "If by keeping to the northward, the current of the Mexican Gulf has set you on soundings on Tortugas Shoal, these soundings, in foggy weather, may be a guide, being properly laid down in the chart. You do not change the color of your water till you get well in with the shoal, but there is generally an eddy current so soon as you are on soundings; therefore, if you stand over to the Florida shore, so soon as your are up to the latitude of 23° 25′ keep as much to the eastward as N. N. E. or N. E. by N., till you get soundings. And, whatever terrible idea people may have of that shore, if the wind will allow you, keep it on board, especially in the autumn and winter seasons, when the N. and N. W. winds are frequent, and the current often runs to leeward. In those seasons, you may take an advantage of the tides on soundings, by carefully observing their times; and this conduct will tend to shorten your passage. When, however, you are got as far windward as the south end of Matacumbe Reef, endeavor to get all the easting you can possibly acquire, in order to get the Bahama shore on board, which is the most eligible in going northward. The proximity of the Reef of Florida will manifest itself clearly in day-light by the white color of the water, and thus there may be no danger in approaching it; but this is far from being the case at night, when it ought to be carefully avoided, and the lead kept constantly going; because, having soundings to the distance of two miles without the steep part of it, they will show the proximity of danger."

tions for the safety of his vessel. As the course of the Gulf Stream comes to be more accurately known, from repeated observations of the heat and latitudes, this method of determining the ship's place will be proportionably more applicable to use. And it derives additional importance from the peculiar circumstances of the American coast, which, from the mouth of the Delaware to the southernmost point of Florida, is every where low, and beset with frequent shoals, running out far into the sea. The Gulf Stream, therefore, which has hitherto served only to increase the perplexities of seamen, will now, if these observations are found to be just in practice, become one of the chief means of their preservation upon this dangerous coast.

Off-Set from the Gulf Stream.

From the superior elevation of the Gulf Stream, its water, about the Bahamas, appears to have a declivity or tendency to the eastward; and there is reason to believe that an off-set of the stream, from without the Maternillo Bank, sets, if not generally, very frequently, to the eastward and S. E. With the usual set of the currents, along the eastern range of the Bahama Islands, we are not accurately acquainted; but, with a N. W. wind, we have no doubt that it is in a S. E. direction. The Europa, a ship of war, returning to Jamaica, by this passage, from a cruise off Havana, in 1787, steered east on the parallel of 30° N. with a westerly wind, until the run was supposed to have brought her on the meridian of Turk's Islands, by which it was intended to pass southward, but an *easterly* current had swept her along as high as that of the Mona Passage. Captain Manderson, of the Royal Navy, who first noticed this event, observes, "if it were once ascertained that a current was common in that part of the ocean, might it not be favorable for vessels bound from Jamaica to the Caribbee Islands, especially in the summer months, during the prevalence of the sea breezes?"

"The ship Fame, Captain J. W. Monteath, a good lunarian, assures me," says Captain Livingston, "that he had been carried three degrees and upwards to the eastward, between the time of his departure from the American coast and making the Windward Passages; but this may have been partly occasioned by the Gulf Stream, which he may have crossed too obliquely in proceeding from Norfolk." The Fame above mentioned was bound from Norfolk, in Virginia, to Kingston, Jamaica, in May, 1816; and in a run of thirteen days, until in the latitude of 29°, and longitude 61°, it was found that the current had set the vessel 3° 10′ E.

"Captain Hall, in the Brig Lowland Lass, passed to windward of Porto Rico, when he thought that he had run through the Mona Passage. Captain Patterson, of the brig Clyde, as I am informed, passed down the Anegada Passage, when he intended to have made the Mona."

Capt. Romans, before quoted, says, "within the edge of the stream is a smooth eddy, gradually changing, as it approaches Hawke Channel and its islands, from the stream's deep blue to a beautiful sea green, and at last into a milk-white. The soundings, under the blue colored water, are generally on a fine white marl; under the sea green, on the said marl, you meet with sponge, white coral, sea-feathers, turtle-grass, and sometimes banks of rocks; and under the white colored water, the soundings are on white marl, with banks or rocks, or white sand. The eddy takes its current in an opposite direction from that of the contiguous stream, viz. south-westwardly."

The soundings of the eddy, provided no reef be in the way between the stream and the Hawke Channel, run from 20 fathoms to 2½; and when the reef divides the stream and the Hawke Channel, the soundings, in some places, are from bottomless at once to 12 or 11 fathoms. Hawke Channel is the channel between Florida Reef and Keys.

"In addition to the above notices, I have been assured, by an intelligent Spanish navigator, that, about thirty years since, vessels bound from Havana to Europe, used generally to cut off three degrees of longitude from their reckoning, on account of this set, which he said, was considered then as certainly existing. At that time the charts were about a degree wrong, which would reduce the Spaniard's allowance to two degrees or thereabout.

"These notices tend to prove that an easterly off-set, from the Gulf Stream, sets to the northward of the Bahamas; of this I am so firmly convinced, that if, in charge of a ship from the Havana, or even New Orleans, bound to Jamaica, I should, if allowed to follow my own plan, run out the Strait of Florida, and attempt making my passage with the aid of this off-set This is to be understood in case I should not have westerly winds in the southern parallels; for such winds are, I am told, more frequent than formerly; and I know that they are by no means of rare occurrence on the S. W. of Cuba."*

* Captain Thomas Hamlin, in the brig Recovery, then in the Gulf Stream, was set to the northward 104 miles, in the 24 hours of the 20th of March, 1830. The ship's place, at noon, 28° 4′ N., 79° 50′ W. To the north-eastward, on the next day, without the stream in lat. 29° 35′, long. 77° 25′, the current was found to have set only 11 miles north, but considerably more to the eastward.

On the 16th of February, 1818, the ship Mars, under the same commander, was at the back of the

It has been found that when Cape Henry, (the south point of the Chesapeake,) bore N. W., 160 leagues distant, a current was setting to the southward, at the rate of 10 or 12 miles per day, which so continued until Cape Henry bore W. N. W. 89 or 90 leagues; the current was then found setting to the N. E. at the rate of 33 or 34 miles per day, which continued until within 32 or 30 leagues of the land; then a current set to the southward and westward, at the rate of 10 or 15 miles per day, to within 12 or 15 miles of the land. This current, which is considered as the eddy of the Gulf Stream, (but which is more probably a continuation of the Labrador current,) sets, more or less, to the S. W., according to the figure of the coast.

It has also been observed by others, that a southern and western current constantly sets in high latitudes between the Gulf Stream and coast, more particularly in soundings, at the rate of a half mile an hour, or more, according to the wind.

An experienced officer of the navy, before quoted, has said, that "in all the observations I made, during five years cruising on the American coast, I never found this eastern current to the southward of latitude 36°, and only once, (the above mentioned time,) so far; it generally prevailing between the latitudes of 37° and 40°, from the longitude of 60° to that of 69°. And I have often, about the latitude of 36° or 37°, and about the above longitude, found a strong current to the south, and south-west. Therefore ships from Europe, bound to America, should endeavor to make the passage either to the southward of latitude 37°, or to the northward of latitude 40°: that is to say, when as far, or to the westward of the Banks of Newfoundland, they should, as much as possible, avoid beating against the wind to the westward, between the latitudes of 37° and 40°.

Upon soundings, along the coasts of Georgia, Carolina, Virginia, New Jersey, and New York, the current runs, in general, parallel to the shore; and is, in general, influenced by the wind, which mostly prevails from between the south and west, producing a slow current of about one or a half knot to the N. E.; but when the N. and E. winds prevail, the current along shore to the south-west will frequently run two knots: on which, the pilots of this coast remark, that the south and S. W. currents, though they but seldom happen, yet they are always stronger than those to the northward, which are more frequent. It is probable the tides may have some influence on these currents, particularly near the entrance of the great bays and inlets. The flood on this coast comes from the N. E. In the months of April and May I have observed, on crossing the Gulf Stream, in the latitude of Cape Henry, that, when near the inside of the stream, the water begins to color of a deeper green; and thence to the edge of soundings there is a strong current from the eastward. The color of the water from green, turns to muddy when on soundings, the current still continuing until within the influence of the tide: this eastern current is, no doubt, occasioned by the discharge of water out of the Chesapeake, by the floods from the snow melting in the country; and it prevails, in some degree, throughout the year, but its effect is greater at this time. It is probable that a similar current prevails off the mouth of the Delaware.

Round the east end of Long Island, and thence to the eastward round Nantucket Shoals, across George's Bank, to Cape Sable, a strong tide runs; the flood setting to the north and west, in order to fill up the bays, rivers, and inlets, and the ebb the contrary. The tides that set across George's Bank into the Bay of Fundy, are very much influenced by the winds, particularly if, after a strong S. or S. E. wind, it should suddenly change to W. or N. W. (circumstances that often happen,) ships will then find themselves drifted by the outset 50 or 60 miles in the 24 hours, or more, to the S. E. The indraught is also great with S. or S. E. winds, which ought to be paid particular attention to.

Upon the Nova Scotia coast the currents run parallel to the shore, but more frequent

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Maternillo Bank, and no northerly current was found; and nearly two degrees farther eastward, in 28° 7′ N., and 76° 58′ W., the current, in 24 hours, had set 3′ S. and 14′ E. The ship was, therefore, evidently in the off-set from the Gulf Stream.

In proceeding onward, towards Ireland, in March, Capt. Hamlin passed about four degrees to the northward of the Azores, and was favored by an easterly current from the parallel of 35½°, and meridian of 57°, until he reached the Salters, on the S. E. coast, where his differences amounted to 3° 36′ E.

Capt. Hamlin, in the Recovery, on his passage outward to Halifax, September, 1819, found the current westerly, from 45′ to 30′ per day, between the parallels of 51° and 46°, long. 29° to 37°. A gale, from the 28th to the 30th of Sept., disturbed the ship's course in about 43° N. and 41° W., after which, to the eastward of the Newfoundland Bank, the current was found to set strongly to the eastward. The ship passed over the bank in the parallel of 43°; the current still strong to the eastward; apparently the Gulf Stream. The Recovery thence proceeded to the southern edge of Banquereau, still finding a strong easterly current, but with diminished strength, which continued thence to the Bank of Sable Island.

The brig afterwards proceeded from Halifax to Jamaica; and on the 23d of Nov., 1819, in 40° N. 62° W., found a slight current to the southward; which, in the parallel of 26° to 23°, near the meridian of 64°, had changed to the eastward; but, on approaching the Silver Key Passage, a slight current to the westward appeared to prevail.

from the eastward than from the westward, particularly in the spring: the southerly winds force them upon the shore by the water running in, to fill up the bays and inlets; and N. and N. W. winds have the same effect in forcing them off shore. A regular tide here runs along shore; the flood from E. N. E.

Remarks on the foregoing, and on the General Character of the North Atlantic Currents, by W. C. Redfield.

It appears from the foregoing observations, that immediately contiguous to the borders of the Gulf Stream, on the coast of the United States, a moderate current is generally found setting to the southward and westward, or in the direction which is opposite to the stream, and parallel to the American coast. By a familiar association, this is styled, by all the fore-mentioned observers, as *an eddy current;* but we shall probably find, on more particular inquiry, that it has little or no claim to this character. An eddy, as is well known, is usually caused by some fixed obstacle opposed to a stream, and is nearly circular in its action. Moreover, it derives its waters directly from the parent stream, and necessarily partakes of the same temperature. I must, therefore, dissent from the views of those persons who refer this current to the eddying action of the Gulf Stream, for these reasons:

1st. Because this current, in open sea, nowhere assumes the *form* of an eddy; but, when unobstructed by violent winds, pursues its course towards the south-west, on a line which is parallel to the general direction of the coast.

2d. Because, on the outward edge of the Gulf Stream at least, there are no obstacles presented which could divert the progress of that portion of the stream, and circumscribe the same in eddies.

3d. Because, if this current was derived from the Gulf Stream, it must necessarily partake of its temperature; but the sudden reduction of temperature on leaving the margin of the Gulf Stream is most remarkable, and is almost unparalleled, except in the immediate vicinity of ice.

We shall in vain attempt to explain this extraordinary change of temperature by the proximity of shallows or soundings, for this cannot avail if the water itself be derived from the Gulf current, to say nothing here of the general unsoundness of this explanation.

I have long since become satisfied that the current in question is neither more nor less than a direct continuation of the polar or Labrador current, which bears southward the great stream of drift ice from Davis' Strait, and which, in its progress to the lower latitudes, is kept in constant proximity to the American coast by the same dynamical law or influence, which, in the northern hemisphere, causes all currents which pass in a southerly direction to incline to the westward, in consequence of the increasing rotative velocity of the earth's surface in the opposite direction, as in the case of the trade winds in the lower latitudes.

In collating the observations of various navigators, we find reason to conclude, that, in ordinary states of weather, this current may be traced from the coast of Newfoundland to Cape Hatteras, and, perhaps, to Florida, the reflux influence which follows a violent gale being of short duration.

According to this view of the case, the Gulf Stream, in its course from Florida to the Bank of Newfoundland, is for the most part imbedded or stratified upon a current which is setting in the opposite direction in its progress from the polar regions. The impulses by which these diverse currents are maintained, being as permanent and unchanging as the diurnal rotation of our planet, their opposite courses on this coast, while in contact with each other, are no more surprising or inexplicable than those of two opposite currents of atmosphere, and the latter are often known to maintain opposite courses for a long period and at high velocities, while thus superimposed one upon the other.

From the fact that these great currents have their origin, one in the tropical and the other in the polar seas, their presence can be unfailingly identified by means of the thermometer; and with the aid of good chronometers their position and extent may be determined with greater certainty than has yet been done, particularly in the latitudes between Nantucket and Florida. In this department of hydrology every navigator may contribute something of value to his profession and to science, for which no other qualifications are required than frequent observations and proper attention to the ship's place. It is desirable, therefore, that every ship master who traverses this region, should make and record his observations hourly upon these currents.

The drift ice from the polar basin is all found in the western portion of the Arctic and North Atlantic Oceans, notwithstanding the influence of violent westerly winds. A writer in the London Nautical Magazine,* supposes that a portion of the polar current,

* Nautical Magazine for March, 1837, p. 139. In this article it is stated that between 42° and 43° west, is the farthest easterly position in which floating masses of ice have been found.

after bearing the ice along the eastern edge of the Grand Bank into the Atlantic, there becomes exhausted, or joins the Florida Stream. By its action the great stream of ice is undoubtedly thus brought within the dissolving influence of the Gulf Stream, and the Grand Bank itself, perhaps, owes its origin to the deposits which have resulted from this process during a long course of ages. But the former current probably "joins" the latter in no other manner than by passing under the same, or yielding it a passage upon its bosom, the order of super-position being mainly determined by the great diversity of temperature. The icebergs being thus carried southward by the deeper polar current, even after the latter has lost its influence at the surface, their rapid destruction is here effected by the tepid water of the Gulf Stream, and we are thus relieved from the dangerous obstructions which would otherwise be found in the lower latitudes of the Atlantic. These two streams of current, therefore, neither meet nor coalesce in any proper sense, but like other currents, both atmospheric and aqueous, pursue each its determinate course, the Gulf Stream being thrown eastward by the greater rotative velocity which it acquired in latitudes nearer the equator, and the polar current being thrown westward along the shoals and soundings of the American continent, and its contiguous ocean depths, by the tardy rotation which it derived in higher latitudes.

The writer, above alluded to, supposes the natural course of the polar current from Davis' Strait, to be towards the coast of Morocco, in North Africa; but a little attention to the effect of the earth's rotation on this current, will show that both it and the ice drifts that are borne on its surface must be turned westward as here described, in despite of the powerful westerly gales which prevail in these latitudes. Light articles, however, like bottles, which are set afloat to determine the drift of currents, will not only yield greatly to the influence of these winds, but on falling into the surface current of the Gulf Stream will, of course, accompany that current in its progress to the coast of Europe, where a leading branch of this stream is found penetrating the polar sea along the coast of Norway, and appears to be ultimately resolved into the Labrador current. The south-easterly branch of the stream assumes the shorter and more direct circuit of gravitation, by the coast of North Africa to the tropical latitudes, from whence it again merges in the Florida Stream. It is by this system of compensation, aided by various subordinate gyrations, such for instance as Rennel's current, that the great mechanical system of oceanic circulation is apparently maintained; and were the influence of winds wholly unfelt upon the ocean, it is probable that the same system would still be maintained, in all its essential features, by the mechanical influences of the earth's rotation, combined with an unstable state of equilibrium.

From the temperature of the sea upon the North American banks and soundings, and in some other positions which are analogous, it has been assumed that the mean temperature of the sea is lower on shoals, than in deep water, but it seems difficult to account satisfactorily for such a result, unless upon the ground already mentioned. It has indeed been ascribed to increased radiation from the bottom, and again it has been denied that such radiation can be carried on through water from a non-luminous body; and, as the colder particles can have no tendency to rise towards the surface, it does not appear how the supposed reduction in the temperature of the bottom can materially affect the temperature of a current of fifty or sixty fathoms in depth, which is derived from a foreign source; for on none of these shoals or soundings is the water permanently quiescent. Were it otherwise, we might reasonably expect a diminution of temperature on shoals in winter, and an increase of temperature in summer, with a permanent increase if in tropical latitudes. I am informed by Mr. Geo. W. Blunt, one of the proprietors of this work, who has kept a thermometrical journal while crossing the Atlantic, that on entering upon soundings in the English Channel, he has found an increase of temperature in the water of 2°, Fahrenheit. Those who differ from our views in regard to these currents, ought therefore to propose some rational hypothesis to account for the great reduction of temperature in the waters which lave the Atlantic coast of the United States. Were these waters derived as an eddy current from the Gulf Stream, it is probable that they would no longer serve for the myriads of codfish which now frequent our shores, and which are known to inhabit the coldest waters.

Many experiments upon the drift of currents have been made with bottles containing memorandums of the date and locality in which they were committed to the sea. These experiments are not without their value, although it is obvious that a circuitous course is liable to be construed into a direct one, and that violent winds may greatly affect the course of such objects upon the surface of the ocean, while an important diversion may result from a mere superficial cross current, as we have noticed in the case of the Gulf Stream. Perhaps the suspension of a light weight to these floats with a line from five to twenty fathoms in length, would afford results of a more satisfactory character, although the duration of such pendulous fixtures can hardly be relied on. If fitted in this manner the fact should be noted upon the memorandum inclosed, which should specify also the length of line which may be attached.

TIDES.

TIDE is a periodical motion of the water of the sea, by which it ebbs and flows twice a day. The *flow* generally continues about 6 hours, during which the water gradually rises till it arrives to its greatest height; then it begins to *ebb*, or decrease, and continues to do so for about 6 more, till it has fallen to nearly its former level; then the flow begins as before. When the water has attained its greatest height, it is said to be *high water;* and when it is done falling, it is called low water.

The cause of the tides is the unequal attraction of the sun and moon upon different parts of the earth; for they attract the parts of the earth's surface nearest to them with a greater force than they do its centre, and attract the centre more than they do the opposite surface. To restore the equilibrium, the waters take a spheroidal figure, whose longer axis is directed towards the attracting luminary. If the moon only acted upon the water, the time of high water would correspond to the time of her passing the meridian, following it by a given interval, which would vary for different ports on account of the retardation arising from the various obstructions the tide meets with in the coasts, bays and channels through which it passes; and as the moon comes to the meridian about 49′ later every day, the tides would be retarded 49′ daily: and it is on this principle that the time of high water is calculated in most books of navigation, although the time thus calculated will sometimes differ an hour from the truth, owing to the neglect of the disturbing force of the sun. The effect of the moon upon the tides is greater than that of the sun, notwithstanding the quantity of matter in the latter is vastly greater than in the former; but the sun, being at a much greater distance from the earth than the moon, attracts the different parts of the earth with nearly the same force; whereas the moon, being at a much less distance, attracts the different parts of the earth with very different forces. According to the latest observations, the mean force of the sun for raising the tides is to the mean force of the moon as 1 to $2\frac{1}{2}$. By the combined effect of the two forces, the tides come on *sooner* when the moon is in her *first* and *third* quarters, and later in the *second* and *fourth* quarters, than they would do if caused only by the moon's attraction. The mean quantity of this acceleration and retardation is given in Table B, subjoined. Its use will be explained hereafter.

The tides are greater than common about thirty-six hours after the new and full moon: these are called *spring tides.* And the tides are lower than common about thirty-six hours after the first and last quarters: these are called *neap tides.* In the former case, the sun and moon conspire to raise the tide in the same place; but in the latter, the sun raises the water where the moon depresses it. When the moon is in her *perigee,* or nearest approach to the earth, the tides rise higher than they do, under the same circumstances, at other times; and are lowest when she is in her *apogee,* or farthest distance from the earth. The spring tides are greatest about the time of the equinoxes, in March and September, and the neap tides are less. All these things would obtain exactly, were the whole surface of the earth covered with sea; but the interruptions caused by the continents, islands, shoals, &c., entirely alter the state of the tides in many cases. A small inland sea, such as the Mediterranean or Baltic, is little subject to tides, because the action of the sun and moon is always nearly equal at the extremities of such seas. In very high latitudes the tides are inconsiderable.

Observations of the tides have been made at Brest, by order of the French government, during a great number of years; and upon these observations La Place has deduced, from his theory, the corrections in the times of high water, and in the height of the tide, on account of the declinations of the sun and moon, and their various distances from the earth. Within a few years the British government have directed that observations of this kind, should be made at the naval stations on the coasts of England, Scotland, and Ireland, and a multitude of observations have been obtained, particularly at the port of London. Mr. Lubbock has deduced, from these last observations, a set of tables for computing the tides at London, with the necessary corrections on account of the situations and distances of the sun and moon. Mr. Whewell has likewise formed, with much labor, a chart of the *cotidal lines* in the Atlantic, Indian, and part of the Pacific Oceans; *these lines being curve lines drawn through all the adjacent places of the ocean which have high water at the same time,* as, for instance, at one o'clock on some given day, at the time of new moon. These tables and chart are published in the Transactions of the Royal Society of London for 1831, 1833, 1834, &c. They are too extensive to be inserted in this work.

From observations which have been made at various times and by many persons, the times of high water, on the days of new and full moon, in the most noted places of the globe, have been collected. These times are usually put in a table against the names of the places, arranged in alphabetical order, as in the tide table of the collection accompa-

nying this work. By means of it the times of high water may be found by various methods. The most common rule prescribed for this purpose, in books of navigation, is that depending on the golden number and epact, the tide being supposed to be uniformly retarded every day. This method will sometimes differ two hours from the truth: for this reason it is not inserted; but, instead of it, we shall make the calculation by the adjoined tables A, B, and the Nautical Almanac. By this method the time of high water may be obtained to a greater degree of exactness than from our common Almanacs.

RULE.

Find the time of the moon's coming to the meridian at Greenwich, on the given day, in the Nautical Almanac. Enter Table A, and find the longitude of the given place, in the left hand column, corresponding to which is a number of minutes to be applied to the time of passing the meridian at Greenwich, by *adding* when in *west* longitude, but *subtracting* when in *east* longitude; the sum or difference will be nearly the time that the moon passes the meridian of the given place. With this time enter Table B, and take out the corresponding correction, which is to be applied to the time of passing the meridian of the place of observation, by adding or subtracting, according to the direction of the table.

To this corrected time add the time of full sea on the full and change days; the sum will be the time of high water, at the given place, reckoning from the noon of the given day. If this sum be greater than 12h. 24m., you must subtract 12h. 24m. from it, and the remainder will be the time of high water nearly, reckoning from the same noon; or, if it exceed 24h. 48m., you must subtract 24h. 48m. from that sum, and the remainder will be the time of high water, reckoning from the same noon, nearly.

EXAMPLE I.

Required the time of high water at Charleston, (S. C.,) March 17, 1836, in the afternoon, civil account.

By the Nautical Almanac, I find that the moon passes the meridian of Greenwich at 0h. 21m.; to this I add 11m., taken from Table A, corresponding to the longitude of Charleston. With the sum, 0h. 32m., I enter Table B, and find (by taking proportional parts) that the correction is 0h. 9m., which is to be subtracted from 0h. 32m., (because immediately over it, in the table, it is marked *sub.*;) to the remainder, 0h. 23m., I add the time of high water, on the full and change days, 7h. 15m., (which is found in the tide table at the end of this collection;) the sum, 7h. 38m., is the mean time of high water on the afternoon of March 17, 1836, civil account.

EXAMPLE II.

Required the time of high water at Portland, (Maine,) May 23, 1836, in the afternoon, civil account.

By the Nautical Almanac, the moon will pass the meridian of Greenwich at 6 hours 21 minutes, P. M. The correction from Table A, corresponding to 70°, (the longitude of Portland,) is 9m., which, being added to 6h. 21m., gives the time of the moon's southing at Portland 6h. 30m., nearly. The number in Table B corresponding to 6h. 30m. is 49m., which is to be subtracted from 6h. 30m. (because immediately over it, in the table, is marked *sub.*) To the difference, 5h. 41m., I add the time of high water, on the full and change days, 10h. 45m., and the sum is 16h. 26m.; consequently the high water is at 16h. 26m. past noon of May 23; that is, at 4h. 26m. A. M. of May 24; and by subtracting 12h. 24m. from 16h. 26m., we have 4h. 2m., which will be nearly the time of high water on the afternoon of May 23, 1836.

In this manner we may obtain the time of high water, at any place, to a considerable degree of accuracy. But the tides are so much influenced by the winds, freshets, &c., that the calculated times will sometimes differ a little from the truth.

Many pilots reckon the time of high water by the point of the compass the moon is upon at that time, allowing 45 minutes for each point. Thus, on the full and change days, if it is high water at noon, they say a north and south moon makes full sea; and if at 11h. 15m., they say a S. by E. or N. by W. moon makes full sea; and in like manner for any other time. But it is a very inaccurate way of finding the time of full sea by the bearing of the moon, except in places where it is high water about noon on the full and change days.

When you have not a Nautical Almanac, you may find the time of high water by means of the following Tables C and D; and although the former method is the most accurate, yet the latter may be useful in many cases. To calculate the time of full sea by this method, observe the following rule:—

RULE.

Enter Table C, and take out the number which stands opposite to the year, and under the month for which the tide is to be calculated. This number, added to the day of the month, will give the moon's age, rejecting 30 when the sum exceeds that number. Against her age, found in the left hand column of Table D, is a number of hours and minutes, in the adjoined column, which being added to the time of high water at the given place, on the full and change days, will give the time of high water required, observing to reject 12h. 24m., or 24h. 48m., when the sum exceeds either of those times.

We shall work the two preceding examples by this rule.

EXAMPLE III.

Required the time of high water at Charleston, (S. C.,) March 17, 1836, in the afternoon, civil account.

In the Table C, opposite 1836, and under March, stand 13, which being added to day of the month 17, gives 30, and by subtracting 30, leaves 0, the moon's age: opposite 0, in Table D, is 0h. 0m., which added to 7h. 15m., the time of high water on the full and change days, gives 7h. 15m. for the time of high water; differing 23 minutes from the former method.

EXAMPLE IV.

Required the time of high water at Portland, (Maine,) May 23, 1836, in the afternoon, civil account.

In the Table C, opposite 1836, and under May, stand 15, which being added to the day of the month 23, gives (by neglecting 30) the moon's age 8: opposite to this, in Table D, is 5h. 39m., which being added to 10h. 45m., the time of high water on the full and change days, gives 16h. 24m., from which subtracting 12h. 24m., there remains 4h. 0m. for the time of full sea May 23, 1836. This differs 2 minutes from the former method.

In the third column of Table D is given the time of the moon's coming to the meridian, for every day of her age. Thus, opposite 11 days stand 8h. 57m., which is the time of her coming to the meridian on that day. This table may be of some use when a Nautical Almanac cannot be procured; but, being calculated upon the supposition that the moon moves uniformly in the equator, the table cannot be very accurate. The numbers in this table are reckoned from noon to noon: thus, 1h. A. M. is denoted by 13h.; 2h. A. M. by 14h., &c.

The time of new moon is easily found, by subtracting the number taken from Table C from 30. *Ex.* Suppose it was required to find the time of new moon for May, 1836. By examining the table, we find the number corresponding to that time is 15; this subtracted from 30, leaves 15; therefore it will be new moon the 15th May, 1836.

When the time of high water is known for any day of the moon's age, we may from thence find the time of high water, on the full and change days, by the following

RULE.

Find the time of the moon's coming to the meridian of Greenwich, in the Nautical Almanac. To this time apply the corrections taken from the Tables A and B, (in the same manner as directed in the preceding rule for finding the time of high water; subtract this corrected time from the observed time of high water, and the remainder will be the time of high water, on the full and change days.

Note.—If the time to be subtracted be greater than the observed time of full sea, you must increase the latter by 12h. 24m., or by 24h. 48m., nearly.

EXAMPLE.

Suppose that, on the 17th March, 1836, the time of high water at Charleston, (S. C.,) was found to be at 7h. 38m. P. M.; required the time of high water on the full and change days.

We find, as in Example I., preceding, that the number to be subtracted is 0h. 23m.; taking this from 7h. 38m. leaves 7h. 15m., which is the time of high water on the full and change days.

When we have no Nautical Almanac, we may find the time of high water, on the full and change, by means of the Tables C and D; for in the fourth example we find, by

Table C, that the moon's age was 8, corresponding to which, in the second column of Table D, is 5h. 39m.; this, subtracted from the time of high water, 4h., after increasing it by 12h. 24m., (because the sum to be subtracted is the greatest,) gives 10h. 45m., for the time of high water on the full and change days.

Table A.

Longitude of the place. Deg.	Correction of Moon's passing the Meridian. Min
0	0
10	1
20	3
30	4
40	5
50	7
60	8
70	9
80	11
90	12
100	14
110	15
120	16
130	18
140	19
150	20
160	22
170	23
180	24

Table B.

Time of Moon's pass'g the Merid. H.	Correction. H.	M.
	Sub.	
0	0	0
1	0	17
2	0	34
3	0	50
4	1	03
5	1	09
6	1	03
7	0	35
	Add	
8	0	2
9	0	23
10	0	24
11	0	14
12	0	0
	Sub.	
13	0	17
14	0	34
15	0	50
16	1	3
17	1	9
18	1	3
19	0	35
	Add	
20	0	02
21	0	23
22	0	24
23	0	14
24	0	0

Table C.

This Table is for finding the Moon's Age.

Add the number taken from the table to the day of the month; the sum (rejecting 30 or 60, if necessary,) will be the moon's age, nearly.

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1836	12	14	13	15	15	16	17	18	19	20	21	22
1837	24	25	24	25	26	27	28	29	1	1	2	3
1838	4	6	5	6	7	8	9	10	12	12	13	13
1839	14	16	15	17	17	19	20	21	23	23	24	24
1840	26	27	26	28	29	1	2	3	5	5	6	7
1841	8	9	7	9	9	11	12	14	15	16	17	18
1842	19	20	18	20	20	22	22	24	26	26	28	29
1843	0	1	0	1	1	3	3	5	7	7	9	9
1844	11	12	11	13	13	14	15	16	18	19	20	21
1845	22	24	22	24	24	25	26	27	29	29	1	2
1846	3	5	3	5	5	7	7	8	10	10	11	12
1847	13	15	13	15	16	17	18	19	21	21	22	23
1848	24	25	25	27	27	29	0	2	3	3	5	5
1849	6	7	6	8	8	10	11	12	14	14	16	16
1850	17	18	17	18	19	20	21	23	24	25	27	27

Table D.

Moon's Age. Day	High Water. H.	M.	Moon passes Meridian. H.	M.
0	0	0	0	0
1	0	35	0	49
2	1	10	1	38
3	1	46	2	26
4	2	22	3	15
5	3	01	4	4
6	3	44	4	53
7	4	35	5	42
8	5	39	6	30
9	6	57	7	19
10	8	15	8	8
11	9	19	8	57
12	10	10	9	46
13	10	54	10	34
14	11	33	11	23
15	12	09	12	12
16	12	44	13	1
17	13	19	13	50
18	13	54	14	38
19	14	31	15	27
20	15	11	16	16
21	15	56	17	05
22	16	49	17	54
23	17	57	18	42
24	19	17	19	31
25	20	32	20	20
26	21	33	21	9
27	22	22	21	58
28	23	04	22	46
29	23	42	23	35
29½	24	00	24	00

In all the preceding calculations of the time of high water, we have neglected the correction arising from the variation of the distances of the sun and moon from the earth, and from the different declinations of those objects. These causes might produce a correction of 10′ or 12′ in the time of high water, and sometimes more; but in general the correction will be much less, and may therefore be neglected.

TABLE,

Showing the TIMES of HIGH WATER, at the Full and Change of the Moon, at the principal Ports and Harbors on the Coasts of North and South America, with the vertical rise of the Tide in feet.

PLACES.	TIME. H.	TIME. M.	RISES. FEET.
A			
Amazon River (Para.)	12		11
Amelia Harbor	8	30	
Annapolis (N. Scotia)	11		30
Ann, Cape	11	59	13
Annapolis (Maryland)	7	12	11
Andrews, St.	10	45	25
Anticosti (W. end)	11		
Apple River (St. Lawrence)	11	45	
Augustine, St.	8	4	6
B			
Broad Bay	10	45	9
Beaver Harbor	8	45	7
Basin of Mines, viz.			
Windsor	12		36
Seven Isles Harbor	11		31
Cape Split	11	15	40
Barnstable Bay	11		9
Berbice	4	30	11
Belle Isle, Straits of	11	30	7
Beaufort (N. C.)	6	52	7
Bermuda	7		5
Boston Light			
Boston (town)	11	31	12
Buzzard's Bay	7	40	5
C			
Cayenne	3	45	6
Canso Cape	8	30	8
Canso Harbor	8	45	7
Casco Bay	10	45	9
Charles, Cape	7	45	
CHARLESTON (S. C.)	7	21	8
Churchill, Cape	7	20	
Chedabucto Bay	7		
Cocayne to Cape Tormentin and thence to Pictou Harbor	7		8
COD, Cape, Race Pt.	11	30	13.6
Country Harbor to White I. Bay	9		8
Cumberland Basin Fort	10	30	71
Crane Island (St. Lawrence)	5	24	17
D			
Delaware Breakwater	7	35	6
Demerara, entrance of River	4	30	9
Dry Tortugas (uncertain)			3
E			
Eastport	11	13	23
Elizabeth Islands (Tarpaulin Cove)	8	52	5
Elizabeth Town Point (New Jersey)	8	54	5
F			
Fear Cape (River)	7		7.6
Fort St. John (Newfoundland)	7	30	6
Fox Island (Penobscot)	10	45	
Frying Pan Shoals	7	40	
G			
Gay Head	7	37	7
George's River	10	45	9
Georgetown Bar	7		4
Goldsborough	11		12
Gosport (Navy Yard) Va.	9		4.5
Green Islands (St. Lawrence)	11	45	16
Gaudaloupe (irregular)			
Gut of Canso	8	30	8
H			
Halifax	7	30	8
Hampton Roads	8	15	3.9
Harbor Delute	12		
Hatteras, Cape	9		5½
Henlopen, Cape	8		
Henry, Cape	7	40	
Hillsborough Inlet	7	30	5
Holmes' Hole	10	10	5
Hood, Port	7	30	6
Howe, Port	8	30	8
I J			
Ice Cove	10		
Isle Verte, or Green Island	8	40	
Jackson, Port	8		8
K			
Kamoraska Isles, St. Lawrence	4		
Kennebeck	10	45	9
Kennebunk	11	15	9
L			
Louisbourg	7	15	5½
M			
Machias	11		12
Mahone Bay to Liverpool H'br.	8		8
Maniconagan Bay	1	12	
Marblehead	11	30	11
Martha's Vineyard (W. Point)			
Martinico (irregular)	6	45	1½
Matane (St. Lawrence)	12	15	
May, Cape	8	45	6
Meogeney Bay	12		
Mobile (Port)			2.1
Monomoy Point	11	30	6
Moose Island	11	30	25
Mount Desert	11	10	13
Mouths of the Mississippi			1½
N			
Nantucket (shoal)	10	44	

PLACES.	TIME. H.	TIME. M.	RISES. FEET.
Nantucket	12	30	2.6
Narragansett Bay	7	45	6
Nassau (N. P.)	6		7
New Bedford	8		
Newburyport	11	15	10
New Haven	11	15	8
New London	8	54	
New and Old Ferolle (Newfoundland)	11	45	
Newport	7	45	6
New York City	8	37	6
Norfolk	8	30	5
O			
Ocracock Inlet	9		
Old Point Comfort	8	27	3.9
P			
Passamaquoddy	11	30	25
Penobscot River	10	45	10
Pensacola Navy Yard			2.3
Pillars (St. Lawrence)	4	45	
Pistolet Bay	5	15	
Placentia Harbor (Newfoundland)	9	15	8
Plymouth	11	30	11
Portland	11	10	12
Port Rico, St. Juan's	8	30	1½
Port Royal	5	46	6
Portsmouth	11	30	10
Providence			
Q			
Quebec	6	30	17
R			
Restigouche Harbor	3		7
Rio Janeiro	2	40	4
Roman (S. C.)	8		
Roseway, Port	6	45	8
Royal, Port	5	46	6
S			
Sable, Cape	8		9
Sable Island, North side	10	30	7
do South side	8	30	7
Salem	11	15	11
Sambro Island	8	15	
Sandy Hook	7	35	7
Savannah	8	9	8.5
Seal Island	8	45	
Seven Islands Harbor (St. Lawrence)	1	40	9
Sheepscut River	10	45	9
Shelburne Harbor	8	30	8
Shepody Bay (St. Lawrence)	11	30	
Ship Harbor, Gut of Canso	8		
St. Bartholomew's (irregular)			1½
St. Croix River	11	30	
St. John's River (Florida)	8	30	
St. John's (New Brunswick)	12		25
St. Mary's Bar	7	30	
St. Nicolas Harbor	12		12
St. Pierre and Miquelon	6	30	7
St. Salvador	3	45	
St. Simon's Bar	7	30	
Sunbury	8		
Surinam (Bram's Point)	4	30	7
Sydney Harbor (Breton Island)	9		6
T			
Tampa Bay (uncertain)			3.3
Tarpaulin Cove	8	52	
Thompson Island (Key West)	9	53	2.6
Tobago (uncertain)			3½
Torbay (Breton Island)	8	45	8
Townsend Harbor	10	45	9
Traverse (St. Lawrence, I. aux Coudres)	6	25	
Trinidad (Port Spain)	3		4
V			
Vera Cruz (only one tide in 24 hours, irregular)			2
Vineyard Sound	11		
W			
Wood's Hole	8	40	

On the coast of the Gulf of Mexico there are no regular tides: the wind regulates the rise and fall.

CURRENTS.

A CURRENT is at present to be understood as a stream on, or a particular set in the direction of, the surface of the sea, occasioned by winds and other impulses, exclusive of (but which may be influenced by) the causes of the tides. It is an observation of Dampier, that currents are scarcely ever felt but at sea, and tides but upon the coasts; and it is certainly an established fact, that currents prevail mostly in those parts where the tides are weak, and scarcely perceptible, or where the sea, apparently little influenced by the causes of the tide, is disposed to a quiescent state. This will be obvious by an attentive consideration of the following descriptions. The necessity of attention to the silent, imperceptible, and therefore dangerous, operation of currents, will be equally apparent.

The currents of the Atlantic are often of a local and temporary nature; yet experience has shown where and how they predominate, and reason will inform the mariner where he is to expect and allow for their operation.

With the greatest velocity of the equinoctial current we cannot pretend to be accurately acquainted. Its central direction, when in full force, is W. N. W., and generally, it is imagined, about one mile and a half in the hour, but increasing to the westward; so that off the coast of Guyana it commonly sets at the rate of two or three miles.

At any considerable distance from the coast of America, the easterly current, caused by the action of violent W. or N. W. winds, is seldom felt to the southward of lat. 36°; consequently the sea about the Bermudas, and thence to southward, is free from the influence of this current. The currents here, though slow, are produced in the direction of the wind, particularly when it is of long continuance. These currents are found stronger near the islands and rocks of Bermudas than at a distance. In a brisk gale, the current here has been experienced from 12 to 18 miles in 24 hours, in the direction of the wind; at other times, when the wind was not settled, no current has been found.

To continued westerly winds are to be attributed the common occurrence of a passage from Halifax to the English Channel in 16 or 18 days, with such currents as those which carried the bowsprit of the Little Belt, sloop of war, lost near Halifax, in 18 months, to the entrance of Basque Roads. The currents of the Atlantic have sent to the shores of the Hebrides the products of Jamaica and Cuba, and of the southern parts of North America.

The easterly and south-easterly currents are blended in their southern regions with the Florida or Gulf Stream, already described, and they do not seem to prevail to the S. W. of the Azores. On the contrary, to the W. S. W. and S. W. of those islands, the currents appear to follow the course of the trade winds towards the Caribbean Sea; and to the southward of the tropic they blend with the equatorial current, which sets from E. S. E. to W. N. W. and W. Towards the west, they occasionally extend to the northward of the Bermudas, and even unite with the southern edge or reflow of the Gulf Stream. The existence of these currents has long been known, but a farther examination and more precise information are still desiderata. The recent examples of them which we have to adduce are not numerous, but they are satisfactory; they also accord with natural facts, and are in unison with that theory which derives its currents from the rotary movement of the earth, and the operation of the trade winds.

"The currents of the Caribbean Sea are probably varied by the influence of the moon, and combine, in some degree, with the tides, especially about Cuba, Jamaica, and St. Domingo."

The Derrotero adds, "this idea is confirmed by what Don Torquato Pedrola, the captain of a frigate, has communicated to the Hydrographic Board. 'Although, generally,' says this officer, 'the currents between the Spanish Main and the West India Islands set towards the fourth quadrant, (that is, north-westerly,) yet it sometimes, though seldom, happens that they are found setting to the first quadrant,' (or N. E.;) in proof of which he states that he perfectly remembers, though he cannot give the elements, in consequence of having lost his journals, that in July, 1795, or 1796, when sailing with a fresh breeze from Santa Martha to Jamaica, in a schooner, he steered for Morant Point; but considering that by keeping as close hauled as that course required, he must be unable to make it before the day was spent, he preferred keeping away, to make the land to leeward of it, and did so at 8 A. M., thus augmenting the rate of the vessel's sailing. At noon he observed the latitude, in conjunction with the pilot, Don Miguel Patina, and found that they were some minutes to the northward of Morant Point; and keeping away W. by S., they saw it at 2 P. M. Although they calculated the direction and velocity of the current, he remembers only that it was to the N. E., and that they were three days crossing from Santa Martha to Jamaica.

"On leaving the parallel of the Bago del Comboy (15° 30′) the first time that the Spanish surveying vessels went in search of it, and being to leeward of the meridian under

which the charts placed it, by 12 leagues, they made sail so that, at the rate of sailing, they expected to join the brig Alerta next evening, as they knew she was waiting for them at her anchorage at the southernmost of the Pedro Keys. At 8 A. M., next day, a vessel was seen ahead, which at first they mistook for a rock, but soon made out that it was a vessel at anchor; and by 9 A. M. they saw not only the Alerta at anchor, but also the Pedro Key, towards which the current carried them with much strength; and in spite of having to make several tacks, in order to fetch the proper channel, they were anchored beside the Alerta by mid-day. The commander does not recollect the longitude he observed that morning, but remembers that the current had carried them to the northward. In the next year, when surveying the west end of the Pedro Shoals, they found the current nearly the same; and this ought to be a warning to navigators not to make too free with the southern edge of the Pedro Shoals during the night.

"Much current has also been found near the Baxo Nuevo, lat. 15° 50′, and long. 78° 40′, as was remarked by the brig Alerta, when near its northern extremity. The same is the case on its southern side; for in prior years, the schooner St. Gregorio, bound from Carthagena to Trinidad, saw the south end of the shoal at 4 P. M. At 5 she was three miles from it; but noticing that the current set strongly towards the shoal, they set all sail and ran to the south until they considered the vessel 9 miles from the southern point; and the following morning tacked to sight it, which she did not effect, having doubtless passed to leeward of it.

"In more than thirty voyages made by Captain Pedrola, from the Spanish Main to Porto Rico, St. Domingo and Cuba, sometimes with chronometers, and others without them, he remarked that between the last two islands and the coast of the main, sixteen miles daily might be counted on for a westerly current, but not so much for the former."

In the Memoir, 3d edition, pp. 68–9, was this passage:—"The trade wind blows with strong and continued vigor at certain seasons, particularly in the winter months, and rolls the waves over a great extent of sea, into the great bay westward of Carthagena, which we have called the Bay of Guatemala. This may cause, at times, an outset, but no constant current is to be found." To this is added, in the Derrotero, "among the original papers possessed by the Deposito Hydrografica, the following observations, by different officers, have been found, which may tend to throw some light upon the matter:

"In the examination of the coast between Porto Velo (Porto Bello) and the Bocas del Toro, made in 1717, by Don Fabian Abances, he found on that coast, in the month of April, strong currents setting to the E. N. E., at the rate of two miles an hour; so that, heaving to at night, off Cocle Point, he found himself in the morning up at Chagre. The winds at the time were either calm or squally from the south-westward. Don Fabian proceeded to the northward, to the parallel of 10°, and then met with winds from N. and N. N. E., with which he steered W. and W. N. W., until he considered himself 10 leagues to the west of the Bocas del Toro; but the current had carried him to the E. S. E., so that, when he expected to make the Bocas, he found himself at the point of Miguel de Borda, about 5 leagues to the westward of Chagre. During the whole time, from leaving Porto Velo, he never gained an observation, the weather being adverse. On the 11th May he noticed that the waters of the Lagoon of Chiriqui ran out through the Bocas with violence, and formed, at a short distance from the coast, an angle bending to the E. S. E."

Again, "The captain of the ship of the line Don Pedro de Obregon, in the month of July, was bound from the Rio Tinto (Black River) to the Havana, and he experienced currents to the north-westward, with winds from the N. E., E. N. E., squalls and calms, and in such a manner that he made the Tortugas Bank of Florida, without having been able to sight Cape Antonio or west end of Cuba."

"Don Joaoquim de Asunsola and la Azuela, in July, found strong currents to the S. W. of Cape Gracias a Dios, after having strong winds from the E. N. E. and E. S. E., with squalls; and from the said cape to the westward he found, also, that the current took the same course; and he concludes that, after he had made Providence Island, and until he arrived at Black River, the currents were strong to the W. and S. W.

"The captain of a frigate, Don Gonzalo Vallejo, when at anchor on the Mosquito coast, near Barancas, or Bragman's Bluff, observed that the current set to the north, at the rate of rather more than half a mile in the hour."

Finally, "Don Ignacio Sanjust, commanding the frigate Flora, on a voyage from Havana to the Gulf of Honduras, and being off Cavallos Point, noticed that the current ran with much force to the N. E. in the month of December; and he adds that, in this gulf, the currents followed no known rule; that near the keys they run with violence, and into the channels between them; so that by them a vessel, during a calm, may soon be carried on the reefs. In the channel between the keys and coast of Honduras, to the south, the water was found setting to the N. E., and, near the coast, to the east."

Near the parallel of 10° N., the currents produced by the N. E. and S. E. trade winds may be imagined to unite; and this united stream, being divided by the Island of Trinidad and the Southern Antillas, thence passes into the Caribbean Sea.

From the mouths of the Amazon, Oronoco, and other rivers, a vast efflux of water falls into the Equatorial Sea, more particularly in the wet season: what effect this water may have on the current is at present unknown. But we learn, from the Derrotero de las Antillas, that "off the coasts of Guyana there are two currents: 1st. The general or equinoctial current, and another caused by the tides: the boundary of the first is 12 leagues from shore, or in the depth of 9 fathoms of water, from which towards the shore that of the tide is experienced. The ebb sets to the N. E., and the flood towards shore. In the Gulf of Paria, also, the tide influences the currents.

"In the southern straits or channels of the Antillas, the velocity of the current inward is seldom under a mile an hour; but its changes are so great that it is impossible to point out its exact direction, or to establish any general rule for its velocity."

"On the Colombian coast, from Trinidad to Cape la Vela, the current sweeps the frontier islands, inclining something to the south, according to the straits which it comes from, and running about 1½ mile an hour with little difference. Between the islands and the coast, and particularly in the proximity of the latter, it has been remarked that the current, at times, runs to the west, and at others, to the east. From Cape la Vela, the principal part of the current runs W. N. W.; and, as it spreads, its velocity diminishes: there is, however, a branch, which runs with the velocity of about a mile an hour, directing itself towards the coast about Carthagena; from this point, and in the space of sea comprehended between 14 degrees of latitude and the coast, it has, however, been observed that, in a dry season, the current runs to the westward, and in the season of the rains, to the eastward.

"On the Mosquito Shore, and in the Bay of Honduras, no rule can be given for the alterations of the current. All that can be said is, at a good distance from land, it has generally been found setting towards the N. W.

"In crossing from the coast, or from Carthagena, to the islands, it has been observed that from La Guayra to the eastern part of St. Domingo, on a voyage made in December, a difference of 106 miles to the westward was found during the seven days the voyage lasted."—*Derrotero de las Antillas.*

Mr. Town, in his Directions for the Colombian Coast, has said, "although between the Island of Jamaica and the Spanish Main westerly currents are most frequent, yet they do not always prevail; for ships have been known to be driven by the current from 50 to 60 miles to the eastward, in 4 or 5 days. From the beginning of May till November, (the rainy season,) the sea breeze seldom or never blows home to the main: and ships going there should never go to the southward of the latitude of 11°, until they are, at least, 40 or 50 miles to the westward of their intended port; after which they may make a south course, as the land breeze, which is generally from the S. W., and the strong easterly current, will set you to the eastward of your intended port, if great care be not taken. When to the eastward, if light winds prevail, you must stand to the northward until you meet the sea breeze, which will be between the latitudes of 10 and 11 degrees, and then run to the westward.

"Being off Porto Bello, in his Majesty's ship Salisbury, on or about the 12th of August, 1816, and being a little to the eastward of that port, with light variable winds for several days, the ship was set to the eastward, at the rate of 50 miles per day; and, having been afterwards placed in the same situation, I found it necessary to make the land well to the westward, and to keep close to it. From November until May, (the dry season,) you should endeavor to make the land well to the eastward, and run along shore; as the sea breezes generally blow very strongly, and the current sets to the westward at the rate of about 2 or 3 miles in an hour.

"Between Chagre and Porto Bello, during the rainy season, there is generally a northerly current, at the rate of from 1½ to 2½ miles an hour. After the end of the rainy season the current sets to the southward and westward, and strong southerly and easterly winds prevail here. From November until May, (the dry season,) the southerly and westerly are very light winds, except in squalls, which end with heavy rain. In sudden squalls, you will often have the winds from all points of the compass.

"If at Chagre, at any time during the rainy season, (May till November,) and bound to the eastward, endeavor to get 4 or 5 leagues from the land so soon as you can; for the winds are, in general, very light, and the current very strong. The latter sets from Chagre directly on the rocks of Porto Bello, and thence along the land from E. by N., E. N. E., E. S. E., and according as the land lies; its general rate being from 1½ to 2½ miles in an hour. Great care should be taken when near the land, if a heavy squall and rain appear to be coming on. During this you will have the wind from all points of the compass, and often so strong that all sail must be taken in.

"In crossing the Gulf of Darien, little or no current will be found; whenever there is any, it sets about south, S. by W., or S. by E., up the Gulf.

"Near Carthagena the current generally goes by the wind; but off the islands of Rosarito it sets to the N. W. and N. N. W., from one to two miles an hour.

"Between Carthagena and the Magdalena, in the rainy season, you cannot put any

dependence on the winds or currents; but, from November to May, the trade wind blows home.

"I should recommend, if turning to windward, with strong trade winds, to keep the shore close to; whereas, by going off from the land, you will not only have a heavy sea, but also a strong N. W. current. If you have light variable winds, approach no nearer to the land than 4 or 5 leagues, as you may be certain of an easterly current."

Captain Livingston says, "during 5 weeks in which I remained at Carthagena, in June and July, 1817, the current in-shore, set constantly and strongly to the northward, at a rate, I am convinced, of not less than 1½ mile an hour, or nearly as strong as the Mississippi at New Orleans. I have seen the Esk, sloop of war, current-rode against a very fresh sea-breeze, when at anchor, nearly west from the city, distant about 1 mile."

Upon the Current between the Grand Cayman and Cape Antonio, Captain Monteath has said, "in the months of May, 1814 and 1815, (two voyages in which I was chief-mate of the ship Prince Regent, from Kingston,) in June 1817, in the ship Fame; and in April and December, 1820, in the ship Mary, between Grand Cayman Island and Cape Antonio, I invariably found the current setting strong to the eastward, or E. S. E.; and I have heard it generally remarked that, vessels shaping a course from the Caymans for Cape Antonio, have found themselves off, or even to the eastward of Cape Corrientes; this has, in the above cases, invariably happened to myself."

Farther on, "in my passage from Kingston, towards Campeche, in the ship Fame, June, 1817, between Cape Antonio and Cape Catoche, I found the current to set due north 27 miles in a run of 18 hours."

We have already given, in the preceding page, the remark of the Spanish navigators on the currents of the Mosquito Shore and Bay of Honduras. We now add those of Captains W. J. Capes, of London, and John Burnett, of Port Glasgow.

Captain Capes says, "between Jamaica and Bonacca the current generally sets to the northward and westward. Here, in May, 1816, I was set 60 miles to the westward by the current, and found that it set rather northerly, from one quarter to half a mile an hour. Between Jamaica and Bonacca are the islands called the Swan Islands, in latitude 17° 22′, longitude 83° 36′. I would not advise any one bound to the Bay to make these islands, for it cannot be of service, and the current is so very irregular about them, that the attempt serves only to bewilder the navigator; and by falling in with them in a dark night, a ship would be in danger of running on shore, as the land is very low.

"About the southern Four Keys the currents are very uncertain. I have known three ships to be lost on these Keys by lying to for the night, after they have made them; for, at all times, the current sets strongly on them; and, in two of the cases, the ships wore every two hours, with an intention to keep their station. In one voyage, I took my departure from Bonacca at four P. M. with a strong breeze from the east, which continued till midnight; it then died away, (no uncommon circumstance in this part,) so that I did not lift the southern Four Keys before four P. M. the next day, from the fore-yard. I then made all snug, and plied to windward, under single-reefed topsails and top-gallant sails over them; tacked ship every three hours during night, and, to my surprise, in the morning, we were not more than one or two miles to windward of them: so, if I had hove the ship to, I have no doubt but she would have been driven on shore by the current.

"If a ship be lying-to, under Rattan, it will not be amiss to try the current. It is my opinion, that the current about Bonacca takes two different directions; one part setting to the N. W. and the other part branching to the S. S. W. I have found it so on several trials, which is the reason that I prefer taking a departure (for the bay) from the middle or east end of Rattan; for, if a ship take her departure from the west end, her course will be N. N. W.; but it very frequently happens that ships get down on those reefs when they take their departure from the west end. The reason is this: a ship steering N. W. from the west end has more of the current on her beam, which sweeps round the west end of Rattan very strong at times; consequently, ships that take their departure from the east or middle part do not feel so much of the current."

Captain Burnett, in his directions for sailing from the Bay of Honduras, says, "when the trade wind prevails, a current, often very strong, sets down between Mauger Key and the Northern Triangle; there, dividing itself, it sets to the southward, between Turneff and the Main Reef, and to the northward between the Triangle Reef and Ambergris Key. It is most advisable, with the wind from the east to E. S. E., to sail to leeward of the Triangle, as you will have a strong current in your favor so soon as you bring it to the eastward of you.

In the channel, between the island Cozumel and the shore, the current along shore runs at the rate of nearly 2½ miles an hour, till lost in the Mexican Sea."

MEXICAN STREAM, &c.—It is, we believe, a well-established, although a controverted fact, that there is a constant indraught on the *western* side of the Channel of Yucatan, into the Mexican Sea; and that there is commonly a reflow on the *eastern* side of the same channel around Cape Antonio, &c.

With the former in its favor, his Majesty's ship Resistance, Captain Adam, off the

Bank of Yucatan, made a course W. N. W. ½ W., nearly 80 leagues in the 24 hours, December 16 and 17, 1806;* and we have no doubt that many instances may be found to prove the same effect; on the Cuba side only, it appears that vessels have been set to the southward; and Captain Manderson has stated, that, when a strong easterly wind has been blowing between Cuba and Florida, vessels heaving to off the south side of Cape Antonio, at about two leagues from shore, have, in the course of one night, been carried against a strong sea-breeze, nearly as high as Cape Corrientes, being a distance of 10 leagues†.

From Cape Antonio the current sets, *at times*, to the E. S. E. past the Isle of Pines. Captain Livingston has informed us that, in March 1818, he found the current between the Great Cayman, and Isle of Pines to set in that direction, at the rate of full 2 miles and a half an hour, or 60 miles in the 24 hours. In August, 1817, he found the set nearly the same, but the current not half so strong. The Spanish Directory says, "from Cape de Cruz, on the south side of Cuba, it is noticed that there is a constant current to the westward, with some inclination to the southward or northward, and which has been known sometimes to set 20 miles in a single day." In opposition to this, the exact words of Captain Livingston are, "I have twice experienced a strong current setting about E. S. E. between the Caymans and Isle of Pines; and on the latter of these occasions, both my mate and myself separately calculated it to set about 60 miles per day, or 2½ per hour. This, however, I incline to think a very particular case, such as may but seldom occur. The winds at this time were light and westerly. On the other occasion, so far as I recollect, it set about 12 or 14 miles per day only. All my papers on these subjects have been lost; but the first instance, was too remarkable to be forgotten."

On the northern coast of St. Domingo, and in the windward passages, there does not appear to be any general current. On the north side of Cuba the case is nearly the same; but in the channel here is a regular tide throughout the year, subject, however, to certain variations.

The currents of the Caribbean Sea, are probably varied by the influence of the moon and change of seasons, and combine, in some degree, with the tides; especially about Cuba, Jamaica, and St. Domingo.‡

In an old book, (Kelly's Navigation, vol. i. 1733,) is an abstract from a journal, which contains the following passage:—"between the west end of Hispaniola and the island of Jamaica, if I took my departure upon a full or change of the moon, I found that I made many leagues more than I did at the quarters of the moon. At the full and change, I was looking out for the land long before I saw it; and, at the quarters, I was down upon it long before I looked for it. The reasons, as I found afterwards, were that the full and change made a strong windward current, and the contrary on the quarters. This has been exemplified in many instances."

On this subject Captain Livingston says, "it is a prevailing opinion with many, that the moon governs entirely, the currents among the West India Islands. No doubt the moon has some effect on them, but I am of opinion that the winds have a still more powerful influence.

"It is rarely, indeed, on the north side of the Island of Jamaica, that there is a westerly current when the north and N. W. winds prevail; the current then always, or almost always, setting to the eastward.

"On the south side of Cuba, when the wind is westerly, which it often is, you are always certain of a re-flowing current round Cape Antonio. This is easily accounted for: as, when the fresh trade wind ceases, and the westerly winds set in, the barrier is, in some degree, removed, which confined the waters in the Gulf of Mexico, and they seek to regain their level as well by the Channel of Yucatan as by the Strait of Florida."

In the windward Channel of Jamaica, the current generally sets with the wind to leeward or S. W., yet, both, here and at Jamaica, it is variable. Some have affirmed that, when a current runs to leeward, on the south side of Jamaica, there is frequently one setting eastward on the north side; and, at other times, no current is to be perceived; also that, when a lee current runs on the north shore, the same circumstances may be perceived on the south shore as were before observed on the north.

But between the Mona Passage and the Caymans, south of the islands, the tendency of the currents towards shore is most commonly found to the north-westward.

In the Bahama Passages the currents are devious; both weather and lee currents

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* The northernmost part of the track extends to 24° 50′ N., longitude 90° 39′ W.

† Captain Rowland Bourke, when once lying-to for the night, off Cape Antonio, found himself next morning off Cape Corrientes.

‡ Captain Colter, of the ship Robert, from the Clyde, some years since threw a bottle overboard to the eastward of Alto Vela, on the south coast of Hayti, and about thirteen months afterwards he saw a Charlestown newspaper, at Kingston, Jamaica, which stated that the bottle had been picked up on the shore, near St. Mary's, in Florida.

having been found. These also appear to be influenced by the tidal causes; for the tides are operative on the banks, and sometimes set strongly.

The following is an additional detail of the best information we have been able to collect, of the currents in the Caribbean and Mexican Seas, from the Derrotero de las Antillas, &c.

In the channel between Trinidad and Grenada the current has been found to set nearly west; on the south side half a point southerly, and on the north side half a point northerly. Its velocity from a mile to a mile and a half per hour.

Between Grenada and St. Vincent's, among the Grenadines, the currents are devious; but the general inset appears to be W. by N.

Between St. Vincent's and St Lucia, the current, from the eastward, sets in more northerly; and within, on the west, it has been found setting to the N. W. Between these islands it seems to be as strong as in any other part of the range.

Between St. Lucia and Martinique it has been found nearly north. Very variable on the western side of the latter.

The current sets nearly in the same manner between Martinique and Dominica; but to the north-westward of the latter, it has been found nearly S. W. three-fourths of a mile hourly. Northward of Guadaloupe it sets W. ½ S., and between Monsterrat and Antigua N. W.

Between Redonda and Nevis it has been found W. S. W. half a mile hourly.

Without Barbuda and the northern isles, it has set about W. by N., and to the northward of the Virgin Isles and Porto Rico about W. S. W.

At the distance of about one degree, within the range of the Caribbee Islands, and to the Virgin Islands, the current has been found setting, in general, to the W. N. W., from one mile to one mile and a half an hour.

In the Mona Passage, between Porto Rico and Hayti, the current has been marked as frequently setting to the N. W., and we have instances of a set through to the S. W., but Captain Monteath, in February, 1816, when proceeding southward towards Porto Rico, in from latitude 23½° to 22°, and longitude 64° to 65°, found the current setting N. N. E. at the rate of 20 miles in the 24 hours: and he says that, off the N. W. end of Porto Rico, it invariably set from the Caribbean Sea to the north and N. N. E. On the western side of the passage it set north, two miles an hour.

From Trinidad, westward, and off the north side of the Spanish Leeward Isles, the current has been found setting west and S. W. to the Gulf of Maracaybo; thence S. W. also to Carthagena: but it varies, as has been already noticed.

From Carthagena towards the channel of Yucatan, it has been found N. N. W., N. W., W. N. W., and N. W. by N., from 1 to nearly 2 miles, and then decreasing to 1½ mile per hour. It has also been found setting to the eastward, as shown in the preceding pages.

At about 40 miles northward of Cape Catoche, the current has been found N. W. by W.: changing thence to S. S. W. off the N. W. point of Yucatan, nearly at the same distance from the coast. Rate something less than half a mile an hour. Between this and Vera Cruz the current ceases.

The action of the S. E. trade wind, in the equatorial regions, and the apparent disposition of the waters in these regions to retire westward, which has been attributed to the rotary motion of the earth, are considered as the causes of a current which is known to flow, during a great part of the year, from the Ethiopic Ocean to the Caribbean Sea, and which has frequently carried ships considerably to the west and W. N. W. of their reckonings, when off the N. W. part of Brazil.

On the east coast of Brazil the currents generally partake of the direction of the monsoons, as before explained, but vary in velocity according to the advance and decline of them, as well as the part of the coast.

Lieutenant Hewett says, during the southerly monsoon, the currents to the southward of Cape St. Augustin are not so powerful as to the northward, where they increase in strength until the months of June and July, and then gradually decline. On the contrary, in the northerly monsoon, they are generally very strong to the southward of Cape St. Augustin, when they are weak to the northward, as they have some difficulty in detaching themselves from the stream, which runs from the S. E. trade around Cape St. Roque.

Mr. Lindley also notices that, "a strong current runs southward from Cape St. Augustin, commencing about the middle of October, and continuing until January, after which there is no particular current till the middle of April, when a powerful one sets in northerly till July, and then subsides in like manner."

The currents of the River Plata, and other local currents near the shores, have been before noticed, in the Descriptions and Sailing Directions.

The following facts establish the existence of the combined current; and they show, in some degree, its force and direction towards the Brazilian coast:

1. In June and July, 1795, the Bombay Castle, East Indiaman, between the Isle of

Palma (of the Canaries) and the coast of Brazil, experienced a westerly current, amounting to $6\frac{1}{2}°$.

2. On May 20, 1802, the Cuffnels, East Indiaman, lost the N. E. trade in $8\frac{1}{2}°$ north, long. 22°. Gained the S. E. trade June 4, in 5° N., long. 21°. From the equator the current was found to set W. and W. by N., from 30 to 52 miles daily, till the coast of Brazil was in sight on the 14th, in 8° S.

3. May 23, 1802, the Sir Edward Hughes lost the N. E. trade in 6° N., long. 23°, and the wind was from S. S. E. on the 25th, in 5° N., and 23° 30′ W. The trade kept far at southward, and the current set strongly to the west.

4. October 16, 1805, the European fleet lost the N. E. trade in 11° N., long. 28°, and gained the S. E. trade on the 26th, in 4° N., long. 29°. On the 4th of November, the land of Brazil was seen in lat. 6° S.; the wind near the land was at E. by S. and E. S. E. By proceeding too far to the westward, two ships of the fleet were wrecked in the morning of the 1st of November, on the Roccas, or Low Keys, in lat. 3° 52′ S., and $33\frac{1}{2}°$ W., and several others had nearly shared the same fate. This catastrophe had probably been avoided by a due knowledge of, and attention to, the effects of the current, which was subsequently ascertained to set $2\frac{1}{2}$ miles per hour to the westward, near the Roccas.

5. On the 1st of June, 1793, the King George, East Indiaman, crossed the line in 30° W., and from the 2d to the 5th experienced a westerly current of 1° 33′. On the 5th Cape St. Roque was in sight, and the ship was kept working until the 10th, endeavoring ineffectually to weather it. She then stood to the north-eastward, closely hauled, to lat. 1° N., in order to regain the variable winds in north latitude, and then proceeded to cross the equator, which was at length effected.

6. In May and June, 1807, the transports, laden with ordnance stores, for the army at Monte Video, by crossing the equator too far to the westward, were carried so far in this direction by the current, that they could not get to the southward of Cape Augustin, (lat. 8° 23′ S.,) and were twice obliged to stand to the northward, into variable winds, to regain easting, after having attempted ineffectually to gain the regular south-east trade wind.

7. It is a well known fact, that several ships have made the isle of Fernando Noronha, on their outward bound passage to India, by the currents having set them to the westward, after the failure of the N. E. trade wind. The current runs strongly about this island.

WINDS.

WIND is a sensible current or movement of the atmosphere over the earth's surface. The winds are divided into Perennial, Periodical, and Variable. They are also divided into General and Particular. Perennial, or Constant Winds, are those which always blow the same way; such is that easterly wind, between the tropics, commonly called the Trade Wind. Periodical Winds, are those which constantly return at certain times: such are land and sea-breezes, blowing alternately from land to sea, and from sea to land. Variable, or Erratic Winds, are such as blow now this way, now that, and are now up, now hushed, without regularity either as to time or place: such are the winds prevalent to the northward of 30° N. latitude.

PERENNIAL, or TRADE WIND.—Over extensive tracts of ocean, in the lower latitudes, or toward the equator, Perennial or Trade Winds are found to prevail, which follow the course of the sun: thus, on the Atlantic Ocean, at about 100 leagues from the African shore, between the latitudes of 10 and 26 degrees, a constant breeze prevails from the north-eastward. Upon approaching the American side, this N. E. wind becomes more easterly, or seldom blows more than one point of the compass from the east, either to the northward or southward.

The Perennial, or Trade Wind, on the American side of the Atlantic, extends, at times, to 30 degrees of latitude, which is about 4 degrees farther to the northward than on the African side. Likewise on the south of the equator, the Perennial Wind, which is here from the S. E., extends 3 or 4 degrees farther towards the coast of Brazil than on the opposite side of the ocean. The general cause of this wind is the motion of the earth, in its diurnal rotation, connected with its orbital movements.

HEAT increases evaporation, and renders the atmosphere capable of supporting a greater quantity of moisture than it would do in a cooler state: were the atmosphere of one continued warmth, and its motion uniform, there would be no rain; for it would not imbibe more moisture in exhalation than it could support. Heat often produces diversity in winds and weather, for near the land, when the sun has great influence, it occa-

sions land and sea breezes near the shore; and, in particular situations, heavy gusts and squalls of wind.*

Small islands, lying at a great distance from the main land, operate very little upon the Trade Wind. If elevated, these islands are more subject to rain than if low: this may be occasioned, principally, by the ascent given to the wind, or atmosphere, in rising over the tops of the hills; when, being cooled, it condenses into small drizzly rain. This is an effect peculiar to all mountains, even in the middle of continents, when the atmosphere is sufficiently charged with moisture. For the sun's rays, by heating the atmosphere, according to its density, renders it much warmer at the bottom than at the top of hills. Upon a mountain sloping from the sea towards the top, and about 700 yards in height, a pleasant breeze has been observed in shore, and fine clear weather; the air in ascending, (being condensed by cold,) at about half way up, had the appearance of fog, or thin light flying clouds; but at the top was a misling rain; and this may frequently be seen in any mountainous country.†

The clouds, in the higher regions of the air, are frequently seen to move in a direction contrary to the wind below. The N. E. Trade Wind has frequently a south-westerly wind above it; and a S. E. wind often prevails beneath one whose direction is N. W. It is found that, just without the limits of the Trade Wind, the wind generally blows from the opposite quarter. The counter current of air, above, is often seen in a fresh Trade Wind.

There are several heights of clouds on the coast of North America; the highest, and those which appear of the finest texture, (if I may be allowed the expression,) float highest in the atmosphere. Clouds of this description always come from the westward; just before the appearance of an easterly storm, they gather in the S. W. and S. S. W., and if a glim (as the sailors call it) in the N. E. and N. N. E., their appearance in the sky indicates a N. E. storm of snow or rain. All great storms which are met with above the latitude of 30°, whether snow or rain, begin to the westward and advance gradually to the eastward, along the coast of North America, in conformity with the general atmospheric current of the region. When a S. W. wind, in the upper regions of the atmosphere, is attended with a N. E. or opposite wind below, the latter is commonly accompanied with low flying clouds, which drive before the wind, while the higher clouds go in a contrary direction.

Ship masters and pilots, on leaving the coast, outward bound, may notice that so long as these higher clouds do not gather and thicken in the W., or S. W., so long a heavy or long storm of snow or rain will not occur. Any rain or foul weather, that proceeds from winds which rise from the eastward, and drive before the wind to the westward, without a fall of the barometer, is not attended with violent wind.

The space from latitude 25° to 28°, or 29°, between the Variable and Trade Winds, is remarkable for a continual change of winds, with sudden gusts and calms, rain, thunder, and lightning. This space has been called the Horse Latitudes, because it has often been found necessary here to throw overboard the horses which were to be transported to the West Indies, &c. To the northward of these latitudes, upon the American coast, and more than one-third over the Atlantic, westerly winds prevail nearly nine months in the year.

In the latitude above the Trade Winds, the wind from the W. S. westward being replete with moisture, from the great exhalation between the tropics, as it approaches the cold and higher latitudes, becomes condensed into showers of hail, rain, or snow.

There is often an interval of calm between the Trade Winds and the opposite winds in high latitudes. This is not, however, always the case; for, if the Trade Wind in its borders be much to the eastward, it frequently changes gradually round without an interval of calm. There is generally also a calm in a certain space between the two pre-

* The causes of tornadoes, hurricanes, and squalls, have been thus assigned by Dr. Hare, of Philadelphia: The air being a perfectly elastic fluid, its density is dependant on pressure, as well as on heat, and it does not follow that air, which may be heated in consequence of its proximity to the earth, will give place to colder air from above. The pressure of the atmosphere varying with the elevation, one stratum of air may be as much rarer by the diminution of pressure consequent to its altitude, as denser by the cold consequent to its remoteness from the earth, and another may be as much denser by the increased pressure arising from its proximity to the earth, as rarer by being warmer. Hence, when unequally heated, different strata of the atmosphere do not always disturb each other. Yet, after a time, the rarefication in the lower stratum, by greater heat, may so far exceed that in the upper stratum, attendant on an inferior degree of pressure, that this stratum may preponderate and begin to descend. Whenever such a movement commences, it must proceed with increasing velocity; for the pressure on the upper stratum, and, of course, its density and weight, increases as it falls; whilst, on the contrary, the density and weight of the lower must lessen it as it rises, and hence the change is, at times, so much accelerated as to occasion the furious and suddenly varying currents of air which attend tornadoes, hurricanes, and squalls.—*Silliman's Journal, No.* 12.

† Oriental Navigator, or East India Directory.

vailing winds blowing in opposite directions, as between the Trade Wind and the westerly wind on the African coast. In the limits of the Trade Wind, a dead calm is generally the prelude to a storm, and it ought always to be considered as a prognostic thereof, though a storm often appears without this warning.

When the sun is at its greatest declination, north of the equator, the S. E. wind, particularly between Brazil and Africa, varying towards the course of the sun, changes a quarter or half a point more to the southward, and the N. E. Trade Wind veers more to the eastward. The contrary happens when the sun is near the southern tropic; for then the S. E. wind, south of the line, gets more to the east, and the N. E. wind, on the Atlantic, veers more to the north.

On the African side of the S. Atlantic, the winds are nearest to the south, and on the American side nearest to the east. In these seas, Doct. Halley observed, that when the wind was eastward, the weather was gloomy, dark, and rainy, with hard gales of wind; but when the wind veered to the southward, the weather generally becomes serene, with gentle breezes, next to a calm.

The Equatorial Limits of the N. E. or Perennial Trade Wind, between the meridians of 18 and 26 degrees west, have been found, upon the comparison of nearly 400 journals, English and French, to vary considerable even in the same months of the year. We have shown, by the annexed table, where the N. E. Trade, according to the probable mean, may be expected to cease in the different months: and it will be found to answer the purpose with sufficient precision.

In this table the columns of extremes show the uncertain termination of the Trade Winds, as experienced in different ships. The annexed columns show the probable mean; and the last column exhibits the mean breadth of the interval between the N. E. and S. E. winds.

Thus the table shows, that, in the month of January, the N. E. Trade has been found sometimes to cease in the parallel of 10°, and sometimes in that of 3° N. That the probable mean of its limit is about 5° N.: that the S. E. Trade, at the same time, has been found to cease sometimes at only half a degree north of the line, and sometimes at 4 degrees: that the probable mean of its limit is, therefore, two degrees and a quarter: and that the interval between the assumed means of the N. E. and S. E. Trade Winds is equal to $2\frac{1}{4}$ degrees: and so of the rest.

Table showing the Equinoctial Limits of the N. E. and S. E. Trade Winds, between the Meridians of 18 and 26 Degrees West.

N. E. TRADE WIND.			S. E. TRADE WIND.		INTERVAL BETWEEN.
CEASES.	General Extremes.	Probable Mean.	General Extremes.	Probable Mean.	Mean Breadth.
In January at..	3° to 10° N.	5° N.	$0\frac{1}{2}$° to 4° N.	$2\frac{3}{4}$° N.	$2\frac{1}{4}$ degrees.
February ..	2 to 10 —	4 —	$0\frac{1}{2}$ to 3 —	$1\frac{1}{4}$ —	$3\frac{1}{2}$
March	2 to 8 —	$4\frac{3}{4}$ —	$0\frac{1}{2}$ to $2\frac{1}{2}$ —	$1\frac{1}{4}$ —	$3\frac{1}{2}$
April	$2\frac{1}{2}$ to 9 —	5 —	0 to $2\frac{1}{2}$ —	$1\frac{1}{4}$ —	$3\frac{3}{4}$
May.....	4 to 10 —	$6\frac{1}{2}$ —	0 to 4 —	$2\frac{1}{2}$ —	4
June.....	$6\frac{1}{2}$ to 13 —	$8\frac{1}{2}$ —	0 to 5 —	3 —	$5\frac{1}{2}$
July	$8\frac{1}{2}$ to 14 —	11 —	1 to 6 —	$3\frac{1}{2}$ —	$7\frac{1}{2}$
August 11	to 15 —	13 —	1 to 5 —	$3\frac{1}{4}$ —	$9\frac{3}{4}$
September .	9 to 14 —	$11\frac{1}{2}$ —	1 to 5 —	3 —	$8\frac{1}{2}$
October....	$7\frac{1}{2}$ to 14 —	10 —	1 to 5 —	3 —	7
November..	6 to 11 —	8 —	1 to 5 —	3 —	$4\frac{1}{4}$
December..	3 to 7 —	$5\frac{1}{2}$ —	1 to $4\frac{1}{2}$ —	$3\frac{1}{4}$ —	$2\frac{1}{4}$

In the space of variable winds between the trades, exhibited in the last column, it has been found that southerly winds prevail more than any other; more particularly when the sun has great northern declination. Homeward bound East India ships are therefore enabled, at this season, to cross the space more quickly than those outward bound; which they do, in some degree, at all other times. Yet calms and variable winds are experienced in every month in the year within this space; but the former, which are more generally in the vicinity of the N. E. Trade, seldom continue long. These calms are frequently succeeded by sudden squalls, against which every precaution should be taken, as many ships have lost their topmasts, and have been otherwise damaged by them. Whirlwinds have sometimes accompanied these squalls.

On the eastern coast of North America, and among its islands, the course of the general easterly or trade wind is uninterrupted, though subject to some modifications in direction and force. At a short distance from the land the sea breeze calms at night, and is replaced by the land breeze. This variation happens every day, unless a strong wind

prevails from the northward or southward; the first of these being experienced from October to May, and the second in July, August and September.

To the southward of Newfoundland, shifts of wind are very common, and it frequently happens that, after blowing a gale upon one point of the compass, the wind suddenly shifts to the opposite point, and blows equally strong. It has been known that while one vessel has been lying to, in a heavy gale of wind, another, not more than 30 leagues distant, has, at the very same time, been in another gale equally heavy, and lying to, with the wind in quite an opposite direction. This fact shows the whirlwind character of these gales, the opposite winds being on opposite sides of the circuit of the gale.

In the year 1782, at the time the Ville de Paris, Centaur, Ramillies, and several other ships of war, either foundered, or were rendered unserviceable, on or near the banks, together with a whole fleet of West Indiamen, excepting five or six, they were all lying to with a hurricane from E. S. E., the wind shifted in an instant to N. W., and blew equally heavy, and every ship lying to, under a square course, foundered.

The winds within the gulf are not so liable to sudden shifts as on the outside, or to the eastward of, Breton Island. The weather to the southward of Magdalen Islands, between them and Prince Edward Island, is generally much clearer than on the north.

BERMUDAS' ISLES.—Near these islands, hurricanes and tempests are very frequent; but the prevailing winds, with fine weather, are from between the south and west. Hakluyt, in his voyages, 1598, calls the sea about the Bermudas a "hellish place for thunder, lightning, and storms:" and another writer, in 1615, describing the arrival of the English at these islands, in 1609, has said, "Sir George Somers, sitting at the sterne, seeing the ship desperate of relief, looking every minute when it would sinke, he espied land, which, according to his and Captain Newport's opinion, shou'd be that dreadful coast of the Bermodes, which islands were, of all nations, said and supposed to be inchanted, and inhabited with witches and devils; which grew by reason of accustomed monstrous thunder, storms, and tempests, neere unto those islands; also for that the whole coast is so wondrous dangerous of rocks that few can approach them but with unspeakable hazard of shipwreck." We now laugh at this; knowing that the mild and regular climate of these islands is preferable even to that of Madeira, and to be preferred for the purity of its air, together with the abundance and quality of fruits and vegetables.

"The general easterly wind of the tropical regions is felt on the coast of Guyana, and on the coasts of the Caribbean and Mexican Seas, but with variations which may be denominated diurnal and annual. The diurnal period is that which the sea breeze causes, and which strikes the coast usually at an angle of two points, less or more, according to the locality and other circumstances; and then the land wind, which, coming from the interior, always blows off shore. The sea breeze comes on at about nine or ten in the forenoon, and continues while the sun is above the horizon, increasing its force as that luminary augments its altitude, and diminishing, in a similar proportion, as the sun's altitude decreases. Thus, when the sun is on the meridian, the sea breeze is at the maximum of its strength; and at the time that the sun reaches the horizon, this breeze has perceptibly ceased. The land breeze commences before midnight, and continues until the rising of the sun, sometimes longer. A space of some hours intervenes between the land breezes ceasing and the sea breezes coming on, during which there is a perfect calm.

"The annual period of the trade wind here is produced by the proximity or distance of the sun, which occasions the only two seasons known in the tropic—the rainy and the dry seasons. The first is when the sun is in the tropic of Cancer, and heavy rains with loud thunder are prevalent. In this season the wind is generally to the southward of east, but interrupted by frequent calms, yet it occasionally blows with force and obscures the atmosphere.

"When the sun removes to the tropic of Capricorn, the dry season commences, and then the trade wind, which is steady at N. E., is cool and agreeable. At this season, N. and N. W. winds are sometimes found blowing with much force, and, indeed, in some degree, they regularly alternate with the general wind, as they are more frequent in November and December than in February and March.

"In the change of the seasons there is a remarkable difference; for in April and May no change is experienced in the atmosphere, and the weather is, in general, beautifully fine; but in August, September, and October, there are usually calms, or very light winds; and dreadful hurricanes in these months sometimes render the navigation perilous. From these perils, however, are exempted the Island of Trinidad, the coasts of Colombia, (late Terra Firma,) the Gulfs or Bays of Darien and Honduras, and the Bight of Vera Cruz, to which the hurricanes do not reach.* In the space of sea between the Great Antillas and the coast of Colombia, the general N. E. or trade wind regularly prevails; but near the shore the following peculiarities are found:

"At the Greater Antillas, the sea breeze constantly prevails by day, and the land

* Hurricanes have sometimes occurred in these regions.—W. C. R.

breeze by night. These land breezes are the freshest which are known, and assist vessels much in getting to the eastward, or remounting to windward, which without them would be almost impossible. At the Lesser Antillas, as Dominica, Martinique, and St. Lucia, &c., there are no land breezes.

"On the coasts of Guyana there are no land breezes, nor more wind than is generally experienced between the tropics. In January, February, and March, the winds here blow from N. to E. N. E., and the weather is clear. In April, May, and June, the winds are from E. to S. E. In July, August, and September, there are calms, with tornadoes from S. and S. W.; and in October, November, and December, there are continual rains, while the sky is, in general, obscured by clouds. In the dry season, which is from January to June, the heat is very great; and in the wet season rains and thunders are constant and violent.

"On the coasts of Cumana and Caraccas, to Cape la Vela, the breeze follows the regular course; but from that cape to Cape San Blas the general wind alters its direction; for it blows from N. E., or N. N. E., excepting in the months of March, April, May, and June, when it comes to E. N. E., and is then so uncommonly strong as to render it necessary for vessels to lie to. These gales, which are well known to mariners, extend from about mid-channel to within two or three leagues of the coast, where they become weak, especially at night. On this coast, about the Gulf of Nicaragua, are westerly winds, which the pilots of that country call vendevales, (rainy winds,) in the months from July to December; but these winds never pass the parallel of 13° N., nor do they blow constantly, but alternate with the sea breeze.

"Upon the Mosquito Shore, Honduras, and eastern coast of Yucatan, the general winds or breezes prevail in February, March, April, and May; but during the first two of these months they are occasionally interrupted by norths. In June, July, and August, the winds here are from the eastward and westward of south, with tornadoes and calms. In September, October, November, December, and January, they are from the northward or southward of west, with frequent gales from W. S. W., W., N. W., and north.

"On the northern and western coast of Yucatan, between Cape Catoche and Point Piedras, or Descondida, and thence to Campeche, there is no other than the N. E. or general wind, interrupted by hard norths in the season of them; and about the end of April, tornadoes commence from N. E. to S. E. These tornadoes generally form in the afternoon, continue about an hour, and by nightfall the serenity of the atmosphere is re-established. The season of the tornadoes continues until September, and in all the time there are sea breezes upon the coast, which blow from N. N. W. to N. E. It has been remarked that, as the sea-breeze is the more fresh, the more fierce is the tornado, especially from June to September. The sea breezes come on at about 11 of the day; and at night the wind gets round to E., E. S. E., or S. E., so that it may be in some degree considered as a land breeze.

"On the coast of the Mexican Sea, from Vera Cruz to Tampico, the breeze from E. S. E. and E. prevails in April, May, June, and July; and at night the land breeze comes off from S. to S. W.: but if the land breeze is from the N. W., with rain, the wind on the following day will be from N., N. N. E., or N. E., particularly in August and September; these winds are denominated in the country, 'vientos de cabeza o vendevales,' (head winds, or rainy winds;) they are not strong, nor do they raise the sea; with them, therefore, a vessel may take an anchorage as well as with the general breeze; but they impede getting out, for which the land breeze is required. The vientos de cabeza, or head winds, reach to about 20 or 30 leagues from the coast, at which distance are found those at E. and E. S. E.

"From the middle of September until the month of March, caution is necessary in making Vera Cruz, for the norths are then very heavy. The narrowness of this harbor, the obstruction formed by the shoals at its entrance, and the slender shelter it affords from the norths, render an attempt to make it during one of them, extremely dangerous, for it will be impossible to take the anchorage. The following description of the winds here, has been written by Don Bernardo de Orta, a captain in the Spanish navy, who has been captain of the Port, and who surveyed it.

"Although in the Gulf of Mexico we cannot say that there is any other constant wind than the general breeze of this region, notwithstanding that, from September to March, the north winds interrupt the general course, and, in some degree, divide the year into two seasons, wet and dry, or of the Breezes and Norths: the first, in which the breezes are settled, is from March to September: and the second, in which the norths blow, is from September to March. For greater clearness we shall explain each separately.

"The first of the norths is regularly felt in the month of September; but, in this month, and the following one, October, the norths do not blow with much force. Sometimes it happens that they do not appear, but, in that case, the breeze is interrupted by heavy rains and tornadoes. In November the norths are established, blow with much

strength, and continue a length of time during December, January, and February. In these months, after they begin, they increase fast; and in four hours or a little more, attain their utmost strength, with which they continue blowing for 48 hours: but afterwards, though they do not cease for some days, they are moderate. In these months the norths are obscure and north-westerly, and they come on so frequently, that there is, in general, not more than 4 or 6 days between them. In March and April they are neither so frequent, nor last so long, and are clearer; but yet they are more fierce for the first 24 hours, and have less north-westing. In the interval before November, in which, as we have said, the norths are established, the weather is beautiful, and the general breeze blows with great regularity by day; the land breeze as regular by night.

"There are various signs by which the coming on of a north may be foreseen; such are, the wind steady at south; the moisture of the walls, and of the pavements of the houses and streets; seeing clearly the Peak of Orizaba and the Mountains of Perote and Villa-Rica, with the cloud on those of St. Martin, having folds like a white sheet; the increase of heat and of dew; and a thick fog or a low scud, flying with velocity to the southward; but the most certain of all is the barometer; for this instrument, in the time of the norths at Vera Cruz, does not vary more, between its highest and lowest range, than eight-tenths; that is to say, it does not rise higher than $30\frac{6}{10}$ inches, nor fall lower than $29\frac{8}{10}$ inches. The descent of the mercury predicts the norths; but they do not begin to blow the moment it sinks, which it always does a short time before the norths come on; at these times lightnings appear on the horizon, especially from N. W. to N. E.; the sea sparkles, cobwebs are seen on the rigging, if by day; with such warnings trust not to the weather, for a north will infallibly come on.

This wind generally moderates at the setting of the sun; that is, it does not retain the same strength which it had from 9 in the morning to three in the afternoon, unless it commences in the evening or at night, for then it may increase otherwise. Sometimes it happens that, after dark, or a little before midnight, it is found to be the land-wind, from the northward and westward; in which case, should it get round to the southward of west, the north will be at an end, and the general breeze will, to a certainty, come on at its regular hour; but if that does not happen at the rising of the sun, or afterwards, and at the turn of the tide, it will return to blow from the north, with the same violence as on the day before, and then it is called a Norte de Marea, or Tide-North.

"The Norths also, sometimes, conclude by taking to the northward and eastward, which is more certain; for, if the wind in the evening gets to N. E., although the sky remained covered the day following, but by night the land breeze has been from the northward and westward, the regular breeze will surely ensue in the evening, good weather succeeding and continuing for 4 or 6 days; the latter period being the longest that it will last to, in the season of the norths; but, if the wind retrograde from N. E. to N. N. E., or N., the weather will be still unsettled.

"Examples are not wanting of norths happening in May, June, July, and August, at which times they are most furious, and are called Nortes del Mueso Colorado; the more moderate are called Chocolateros, but these are rather uncommon.

"The wet season, or the season of the breezes, is from March to September; the breezes, at the end of March, and through the whole month of April, as already explained, are from time to time interrupted by norths, and are from E. S. E. very fresh; the sky sometimes clear, at other times obscure. At times these touch from S. E. and continue all night, without giving place to the land-breeze, which prevails, in general, every night, excepting when the north wind is on. The land-breeze is freshest when the rains have begun.

"After the sun passes the zenith of Vera Cruz, and until he returns to it, that is from the 16th of May to the 27th of July, the breezes are of the lightest description; almost calms, with much mist or haze, and slight tornadoes. After that time, the pleasant breezes from N. W. to N. E. sometimes remain fixed.

"From the 27th of July to the middle of October, when the norths become established, the tornadoes are fierce, with heavy rains, thunder, and lightning; those which bring the heaviest winds are from the east, but they are also of the shortest duration.

"In the season of Breezes, the total variation of the barometer is four-tenths; the greatest ascent of the mercury is to 30 inches thirty-five-one-hundredths, and its greatest descent to 29 inches ninety-six-one-hundredths. The thermometer in July rises to 87°, and does not fall to $83\frac{1}{2}$°; in December it rises to $80\frac{1}{2}$°, but never falls below $66\frac{1}{2}$°.—This, it must be understood, was ascertained in the shade, the instrument being placed in one of the coolest and best ventilated halls in the castle.

"In the months of August and September, rarely a year passes without hurricanes near Florida and the northern Antillas; but to Vera Cruz, or any part of the coast thence to Campeche, they never arise; all that is felt being the heavy sea, which has arisen in the higher latitudes. Hurricanes begin blowing from the northward and eastward; and although they do not always go round the same way, yet in general they next go to the southward and eastward, with thick squally weather and rain."

From Tampico to Bay of St. Bernard, the winds are continually from E. to S., and light from the month of April to August: the contrary is experienced in the other months. This coast is exposed on account of the hardness of gales from E. and E. S. E., which blow without intermission for two or three days before hauling to the northward.

In latitude 26° 30′ N., there are land breezes at night, which blow from midnight to nine A. M.

From Bay St. Bernard to the Mississippi, there are land-breezes at daylight, and on the day's entering, the winds haul to S. E. and E. S. E. and in the afternoon it generally hauls S. W. In winter the southerly winds are very tempestuous, and blow for the space of two or three days. The months most to be feared to navigate this sea, are August, September, October, and November, in which there are hurricanes and winds on shore so heavy that no canvass can stand them; upon the Mississippi, and all its mouths, there are very thick fogs very frequently, especially in February, March and April, and in June and July.

From the Mississippi to lat 28° N., in the month of April to July, the reigning winds are generally from N. to E. and from E. to S. in the morning, and in the afternoon they haul S. W. These S. W. winds are tempestuous in August, September, and October, an epoch in which are also experienced heavy southers and hurricanes. From November to March the winds blow from the northward, beginning first from S. E. and S., with heavy rain, when it hauls to S. W. and W., and blows very heavy, till it hauls to N. W. and N., when it clears the weather, and then to N. E., and is mild.

From lat. 28° N. to the southernmost of the Florida Keys, the trade wind reigns in the morning, and at mid-day it hauls in from the sea. This happens in summer, but in winter, especially from November to March, the winds blow from S. to W., and raise a very heavy sea.

In the new channel of Bahama, the reigning wind is the trade, interrupted in winter by norths, and in summer by calms. Although the northern limit of this channel is in 28° 30′ N., and consequently within the limits of the trades, yet it is necessary to keep in mind that in winter, that is, from November to April, you will meet with the variables at or before you arrive to lat. 27°, which variables are from E. to S. and from S. to W., and in summer you have calms and light airs from S. to W. and from W. to N.

ON THE EASTERN COAST OF BRAZIL, between the months of September and March, the winds generally prevail from N. by E. to N. E. by E. Between March and September the prevailing winds are from E. by N. to E. S. E.

The former of these is generally termed the northerly monsoon, and the latter, the southerly one; although there appears, in fact, to be no direct and opposite change in them on or about the equinoxes, as is generally the case with the winds so called.

These winds are simply a continuation of the S. E. trade, which changes its direction as above described, and is influenced by the land on its approach thereto. When the sun is to the northward, no particular difference is observed in the S. E. trade, but it may be carried within sight of the coast, with scarcely any deviation; nevertheless, about both equinoxes, but more especially when the sun is advancing to the northward, calms and very light winds, with apparently no settled quarter, will prevail near the coast; and this may be said to be more particularly the case on that part of it between the Abrolhos and Cape Frio. As the sun advances to the southward, the trade wind will generally come round to the north-eastward, and will have its retrograde movement with the return of the sun to the equinox. At this latter season, ships, on approaching the coast, will begin to observe this northerly inclination of the S. E. trade, when within four or five degrees of it, and which they will find gradually to increase as they incline to the westward.

Within a few miles of the coast, and in the different roadsteads and harbors, the wind generally blows directly upon it; and, in the deep harbors, and upon the shore, this is generally superseded by a land-breeze which sometimes lasts a greater part of the night. About Rio de Janeiro this land-breeze sometimes extends as far seaward as Round Island, while at Pernambuco it rarely reaches the roadstead.

The preceding remarks are those of Lieutenant Hewett. Pimentel, and, after him, M. D'Apres, has said that the winds of the northerly monsoons, between September and March, are from N. E. and E. N. E., or less northerly than as above; and that those of the southerly monsoon are from E. S. E. to S. S. E., or more southerly. It may therefore be admitted, that they do sometimes prevail more from the south, and that those near the north but seldom occur.

Mr. Lindley, in his narrative of a voyage to Brazil, having resided a considerable time on shore, at Bahia, &c., has described the in-shore wind as follows:—"From Cape St. Augustine, (southward,) the wind blows, 9 months in the year, chiefly north-easterly in the morning, and north-westerly during the evening and night. This continues gradually changing along the coast, till, at Rio de Janeiro and the Rio Plata, it becomes a regular land breeze from evening till morning, and throughout the day the reverse. During the three stormy months, that is, from the latter end of February to that of

May, the wind is generally southerly, blowing very fresh and squally, at times, from the south-west.

Lieutenant Hewett has observed, that the winds off Cape Frio are seldom found to the southward of east; and in the northern monsoon they are generally to the northward of N. E. Heavy and violent squalls are occasionally met with in rounding the Cape, to obviate the effects of which every precaution is required.

The same officer adds, that at Rio de Janeiro, the sea-breeze varies in its commencement from ten to one o'clock in the forenoon, and ceases in the evening between the hours of seven and eleven. At the full and change of the moon, violent squalls from the N. W., named by the Portuguese "Tere Altos," immediately supersede the sea-breeze, lasting from four to six hours.

Captain Peter Heywood, in the British frigate Nereus, was for three years on the Brazil station, and the greater part of that time in the River Plata. This gentleman describes the winds in page 553 of this work.

The late Captain John M'Bride, of the Royal Navy, kept a regular journal of the winds and weather at the Falkland Islands, from 1st of February, 1766, to 19th January, 1767, which was published in 1775, by Mr. Dalrymple. The journal concludes with the following general remarks:

"From going over the following journal of the winds, for the space of one year, they will be found to prevail in the western quarter, and generally blow a close reefed topsail gale, with a cool air. In November the winds begin to be more frequent in the N. W. quarter, generally hazy weather, and for the most part blow about 16 or 20 hours, when it begins to rain: the wind then regularly shifts into the westward, and so on, till it gets to the S. W. by S., and S. S. W., when it blows fresh, and clears up. This S. S. W. wind continues for about 16 hours, then dies away, when the wind shifts again to the N. W. quarter; this continues during December, January, and February, and changes in the manner above mentioned, every three or four days. As March comes on, you have these changes but seldom; and as the winter advances, they are seldom in the N. W. quarter, but rather incline to the E. N. E., which is generally accompanied with sleet and snow. There is not the least proportion in the gales betwen winter and summer. In summer, (as I have before observed,) as the winds are in the westward, they blow in such heavy squalls off the tops of the mountains, that it is sometimes an hour before a cutter can row to the shore, although the water is smooth, and the distance of but one cable and a half off. In the winter, the winds are pent up by a keen frosty air. The most lasting gales are those from S. by E. to S. by W., and are extremely cold."

Observations on the Winds, by Captain Frederick Chamier, R. N.

"The trade winds, in the West Indies, generally blow from N. E. to S. E., varying according to circumstances, which will be hereafter expressed. About Barbadoes and the Windward Islands, that is, from Tobago to Barbuda, the wind will be found to veer more to the northward in the early part of the year, than in the months of June, July, and August. In the more northern islands, such as Dominica, Montserrat, Antigua, Nevis, &c., the wind, in the evenings of January, February, and March, veers round to about north, or N. N. E., blows very fresh in squalls; and from the extensive space of ocean over which it travels, becomes cool and very refreshing. The thermometer, even in English Harbor, in the above months, at 8 o'clock P. M., I never saw above 76°. In this season of the year, the sickness of the hot months is no longer experienced; the general lassitude of the mornings and noons of July and August seems forgotten; and no man who visited these islands during the first three months of the year, would believe that the change of seventy or eighty days could make such an amazing difference in the look, as well as in the energy, of the inhabitants of the Windward Islands. In the change of seasons (from wet to dry) a great difference is experienced in the winds. In April and May, the atmosphere is in general clear, and fine weather prevails; but in August, September, and October, calms or very light winds are not uncommon. Strong hurricanes blow in these months.

"In speaking of hurricanes, they are well known to have been very rarely experienced in Trinidad. The main land of Colombia, the Gulf of Darien and Honduras, and likewise Vera Cruz, are almost exempt from this scourge. In the "Derrotero de las Antillas," however, mention is made of a hurricane having been experienced on the morning of the 18th of August, 1810.

"In the greater Antilles, such as Jamaica, Cuba, St. Domingo (or Hayti,) and Porto Rico, the sea-breeze blows by day, and the land wind by night; but in the lesser Antilles, such as Martinico, Dominica, St. Lucia, Antigua, &c., land winds are very uncommon; and certainly, in all my cruizing in these seas, about these islands, I never experienced the land wind.

From the Coast of Cumana to Punta Aguja, the common trade wind constantly blows at E. S. E. to E. N. E., the land wind being uncommon, but still not unknown. At an-

chor, in La Guayra Road, in February, 1827, a very light cool land wind, from the S. S. W. occasionally reached the ship, but I doubt its ever extending more than five miles to sea. On the evening of the 20th October, 1816, a heavy squall came from the S. S. W. off Cape la Vela, and blew for some time with violence. I have merely mentioned the two above facts, because in the Derrotero it is asserted that land winds are rarely known on this coast.

"The coast between Cape la Vela and Santa Martha seems more accustomed to changes of wind than any other part of the West Indies. Although the remarks of some celebrated Spanish navigators would lead us to believe that the winds blow so fiercely from the E. N. E. that ships are obliged to lie to; yet I have, in the month of August, by keeping close in shore between Punta Aguja and Cape la Vela, had the wind at west for two or three days together; and until we had passed Rio de la Hacha, and opened Cape la Vela, we neither had easterly winds nor westerly currents.

"In that part of the coast of Yucatan, between Cape Catoche and Punta Piedras, or Deconocida, and that coast which trends to the southward to Campeche, the trade winds have generally been at E. N. E. In the evening, towards September, the wind occasionally veers to the E. S. E., and this has been called a "land wind" by many authors.

"At all seasons of the year, I have experienced land winds on the coast of Cuba; that is, from Cape Corientes to St. Jago de Cuba. If the sea breeze, which in Cuba as well as Jamaica and St. Domingo (or Hayti,) generally begins about nine o'clock in the morning, and freshens until noon, should in the evening about sun-set dwindle to nearly a calm, you may be certain of a light air off the land:—a mark to judge by, and which I never knew to fail, was the clouds hanging heavily over the blue mountains of Jamaica, or Copper Hills of Cuba.

"The winds operate very little upon the thermometer. From May to October in Jamaica, at day-dawn, 82° will be the average; it will be 88° at noon, and again, 82° in the evening. To find the thermometer at 78° during the night, even in a place where the wind circulates freely, cooled also by the dew, is a luxury so rarely likely to occur, that in looking over my private Journal for two years, I cannot discover one instance of it in the above months; yet still, the land winds, to those who have been long residents in the country, is a luxury most eagerly expected, and most welcomely received. It is of so different a kind from the sea breeze, that respiration becomes easy; whereas, with the thermometer at 90° at Port Royal, and the sea breeze blowing nearly a gale, I have found inhaling the hot wind very oppressive and very relaxing.

"It would very far exceed the limits I propose for these remarks, to dwell upon the different changes and different winds in these seas, although I have kept a most accurate private Journal, from which I have extracted the foregoing remarks. It is merely requisite to mention, in conclusion, the season of the 'norths' in the Gulf of Mexico.

"Don Bernardo de Orta has given one of the best and truest accounts of these winds that I have seen; comparing this with the accounts of Humboldt and Don Cosmo Churruca, it will be seen that the norths are so well marked, that nobody could mistake the approach of one. For instance, lying in Sacrificios, near Vera Cruz, if the peak of Orizaba is very clear in the morning, a light thin cloud here and there, and the streets of Vera Cruz, the walls of the houses, &c. damp,—before night you will have a hard gale of wind. Its duration is very uncertain.

"These winds, which commence about the end of July, and continue to February, and sometimes to March, blow occasionally with great violence, beginning generally at the N. E., flying round the compass, and ultimately settling at N. N. W. When the wind begins to veer again towards either the east or the west, the gale will soon be over. In the night time, the highly phosphorescent appearance of the sea, marks the approach of the gale: and the squall being visible long before it approaches, gives ample time to reduce sail, and to have every thing prepared.

"Between Jamaica and Maracaybo, and in the space between the latter and St. Domingo, I have always observed, that should the trade wind at day-light be at E. N. E., at noon it will generally be about E. by S., if the day is clear. The knowledge of this gives a great advantage in a windward beat; and by this means, watching the variation of the wind, you will be able to head the current for some hours,—an advantage which every one must perceive."

CURSORY REMARKS AND SUGGESTIONS ON VARIOUS TOPICS IN METEOROLOGY.

BY AN AMATEUR OBSERVER.

The science of Meteorologly is not only interesting to the philosophic observer, but the natural phenomena of which it takes cognizance are such as daily affect the interest and comfort of every member of the human family. But to no class of persons are these phenomena, as exhibited in various parts of the world, of so much practical importance as to the members of the nautical profession. A competent knowledge of these exhibitions, or of geographical meteorology, is therefore an important element of that varied knowledge which is acquired by the skilful navigator.

In the preceding pages of the American Coast Pilot, will be found a valuable collection of observations on the winds which have been found to prevail in the Atlantic Ocean, and on different portions of the American Coast. We now proceed to exhibit a more general and cursory view of the atmosphere and winds, and of various atmospheric phenomena which occur in these regions.

General View of the Atmosphere.

The transparent aerial fluid which surrounds our globe, and which we denominate *the atmosphere*, forms a comparatively thin stratum or envelope, which in the immediate vicinity of the earth, is greatly compressed by its own weight, and which in its most expanded and tenuous state is supposed to extend itself to the height of only forty-five or fifty miles from the earth's surface. Its superincumbent pressure or weight is ascertained by means of the barometer, and is equal to a column of mercury about thirty inches in height. By means of this instrument we learn that one half its weight or actual quantity is within three miles and a half of the surface of the ocean; and it is within this limit that nearly all the visible or important phenomena of the atmosphere are apparently developed. The lower surface of the atmosphere is equal to about 200,000,000 square miles; and as a compression of the whole mass to the common density which it exhibits at the sea level, would reduce its entire height to about five miles, it follows that by this standard of comparison the height or thickness of the atmosphere is to its superficial extent in the proportion of only 1 to 40,000,000.

These several facts are too important to be lost sight of in our general reasonings upon the phenomena of the atmosphere; and the more so, as we are prone to give too much *altitude* to our conceptions on these subjects. If we even consider the proper height or thickness of the atmosphere as equal to fifty miles, still, as compared with its entire surface, this is only equal to one five hundredth of the proportion which the thickness of a common sheet of paper, of the foolscap size, bears to its surface dimensions; and if we view the atmosphere either as condensed to the mean of the surface pressure, or in relation to the actual limit of all its tangible phenomena, it will only be equal to one five-thousandth part of the proportional thickness above mentioned. We may hence perceive the inapplicability of analogical reasonings that are founded on the movements which occur in a chimney, or in an inclosed apartment, as attempted to be applied in explanation of the general movements of the atmosphere.

Two instruments of modern invention, the *barometer* and *thermometer*, are truly invaluable as testing the condition of the atmosphere, and their use should be familiar to every navigator. By the first, as we have seen, the amount or weight of the superincumbent atmosphere, at any place, may always be accurately known, and by the indications of the other, the temperature of the air, as well as of the ocean, may be ascertained with equal precision.

Among the most striking peculiarities of the atmosphere, are its rapid and almost constant movements of progression or circulation, which, with some unimportant exceptions, appear to prevail throughout the globe. These movements evidently show the continued operation of some powerful impulse, which, to the writer at least, does not appear to have been satisfactorily explained. It is estimated from the average rate of sailing of ships during long voyages through different seas, and from other data, that the average velocity of the wind near the surface of the ocean is equal to eighteen miles an hour throughout the year, and in the common region of the clouds the velocity must be much greater.

Temperature of Elevation.

Elevation above the level of the sea, or the general level of a country, causes a regular variation in temperature. The first 300 feet usually causes a difference of about one

degree of Fahrenheit's thermometer. After ascending 300 feet, it is estimated that the thermometer falls a degree in 295 feet, then at 277, 252, 223, and 192 feet; but 300 feet to a degree is a common rule. On these principles the limit of perpetual frost has been calculated. It is made a little more than 15,000 feet at the equator, and from that to 13,000 between the tropics, and from 9,000 to 4,000 feet between latitudes 40° and 59°.

It has been found, however, that the above rule is subject to great variations, owing, probably, to the course, temperature, and super-position of the atmospheric currents which prevail in different regions at different altitudes. Colder currents are often found resting upon, or interposed between, those of a higher temperature, and *vice versa*. On the Himalaya Mountains, in Asia, between the latitudes of 28° and 34° north, the region of vegetation has been found to extend several thousand feet above the supposed line of congelation in those latitudes. It is also remarkable, that the line of perpetual snow is found at a much greater altitude on the *northern* side of these mountains than on the southern side, in a lower latitude. From this it may be inferred that the temperature in high regions, as well as in lower situations, is greatly affected by the geographical course and physical condition of the currents of atmosphere which prevail in these regions.

Stratification and Elevation of the Currents of the Atmosphere.

It is obvious, from the courses of the clouds and other light bodies which sometimes float in the atmosphere, that the movements of the latter are mainly horizontal, or parallel to the earth's surface. Notwithstanding this, the common theory of winds supposes a constant rising of the atmosphere in the equatorial regions, connected with a flow in the higher atmosphere towards the polar regions, and a counter flow at the surface towards the equator, to supply the ascending current. This ascending movement, however, has never yet been discovered, and it is easy to perceive that if it existed in the manner supposed, its magnitude and velocity must be altogether too great to have eluded observation.

It is apparent, however, that different currents often prevail at different altitudes, superimposed one upon another, and moving at the same time in different directions. These currents are often of different temperatures and hygrometrical conditions, and are found moving with different degrees of velocity. It is by the influence of these currents that volcanic ashes, and other light substances, which are elevated by means of whirlwinds to the higher regions of the atmosphere, are conveyed to great distances, and in directions which are often contrary, to the prevailing wind at the surface. On the eruption in St. Vincent, in 1812, ashes were thus deposited at Barbadoes, which is 60 or 70 miles to the windward, and also on the decks of vessels still farther eastward, while the trade wind was blowing in its usual direction. On the great eruption of the volcano of Cosiguina, on the shores of the Pacific, in Gautemala, in January, 1835, the volcanic ashes fell upon the island of Jamaica, at the distance of 800 miles in a direct line from the volcano. Facts like these ought to put at rest the common theory of the trade winds, according to which, these ashes would sooner have fallen upon the northern shores of the Gulf of Mexico, or the peninsula of Florida. On the same occasion the volcanic ashes were also carried westward in the direction contrary to the trade wind on that coast, and fell upon H. M. ship Conway, in the Pacific, in lat. 7° N., long. 105° W., more than 1,200 miles distant from the volcano, in the direction which is nearly opposite from Jamaica. These phenomena were doubtless the effect of two different currents prevailing at different elevations; but we shall seek in vain, in these developments, for proof of the commonly received but imaginary system of the trade winds.

The occasional interposition of a warmer current of atmosphere between the lower current and the higher regions has been proved by the observations of æronauts. In countries situated like the United States, where the surface is often occupied in winter, for long periods, by an intensely cold stratum of air from the interior elevations, the warm currents from lower latitudes appear to find their way at a superior elevation; and their presence in this position is often demonstrated by the phenomenon which they induce.

Clouds, Fogs, and Rain.

The atmosphere is always pervaded by water in the form of transparent or invisible vapor, and the process of evaporation is continually carried on, except in cases where the thermometer is below what is called the dew point, or when the vapor is being condensed in the form of clouds, fogs, or rain. "Clouds and fogs are the same thing, being an assemblage of small vesicles of water floating in the atmosphere. At a distance in the atmosphere we see the whole as a cloud, but when the vapor sinks to the earth, or will not rise, and we are immersed in it, we call it a fog. Dew-fogs, which hang over fields, are *stratus* clouds; and fogs which involve elevated objects, are *cumulous* clouds." It is to circumstances of distribution, light, shade, distance, and perspective, that the great variety in the *appearance* of the clouds is owing; and on this variety of appearance

the following classification has been founded, by which the clouds have been considered as pertaining to seven classes:

1. Like a lock of hair, or a feather, called *cirrus*.
2. A cloud in conical or rounded heaps, called *cumulus*.
3. A horizontal sheet, called *stratus*.
4. A system of small fleecy or rounded clouds, called *cirro-cumulus*.
5. The wavy or undulating stratus, called *cirro-stratus*.
6. The cumulus and cirro-stratus mixed, called *cumulo-stratus*.
7. A cumulus spreading out in cirrus, and raining beneath, called *nimbus*.

The cirrus is usually the most elevated—sometimes as a gauze veil, or parallel threads. Its height is apparently from one to four miles.

Dew is the condensation of aqueous vapor upon the surface of a condensing body or substance. Clouds and fogs are watery particles condensed from aqueous vapor while floating in the atmosphere, where they continue to float till precipitated, or again dissolved. If by the concentration of these particles, or by any additional condensation, their weight be increased beyond that which the extent of their surface can sustain, they then descend in the form of rain; and as the condensation ordinarily increases as the drops increase in magnitude, it is common to have more rain fall on the surface of the ground than on an equal space upon the top of a house or church. Clouds, fogs, and rain are therefore essentially the same, the latter being the continuation or extension of the same process which produced the former.

Owing to the evaporating qualities of the atmosphere in the higher regions, as well as to the intensity of cold which there uniformly prevails, distinct clouds are seldom, if ever, found at a greater elevation than the summits of the highest mountains, which is about five miles. At an intermediate region, however, the clouds are often at a temperature above freezing, while the air at the surface is much below the freezing point, and the earth covered with snow. This condition of the clouds seems not unfrequently evident by their appearance to the eye of an observer. Snowy or frozen clouds are usually dim and undefined in their aspect or appearance; and a fall of snow may not unaptly be termed the fall of a frozen cloud.

Of Hail.

Hail of small size, as it falls in wintry storms, appears as frozen rain-drops. From the occurrence of this phenomenon in a freezing state of weather, we find evidence that a stratum of air in the region of clouds is at a temperature above the freezing point, or warmer than that which is found at the surface at the same time. A heavy fall of snow affords, perhaps, the same indication.

Summer hail of large size, which is deposited in a definite path or vein, or in a locality of limited extent, is usually accompanied by heavy thunder and vivid or continued lightnings, or a heavy rumbling sound or rapid concussions, high winds, &c., and is believed to be the production of a vortex or whirlwind in the atmosphere, which is connected at its upper extremity with an overlaying stratum of unusually cold air. A portion of this cold stratum probably descends on the exterior of the vortex, and reaching the earth's surface, is pressed into the vortex, and there entwined or laminated with the layer of warm and humid air of the surface, which is drawn in at the same time. A rapid condensation, as is known, thus commences at the lower extremity of the whirling mass or column, and the condensed drops, alternately in a freezing and unfrozen layer of air, are carried upward by the powerful whirling and ascending action of the vortex, till, with the successive coatings of condensation received, they are finally discharged into the cold stratum at the upward extremity of the vortex, owing to the reduced temperature of which, they are prepared to receive a renewed accession during their fall to the earth; or perhaps by their accumulated weight they are sometimes thrown through the sides of the vortex before reaching its higher extremity. By this violent gyratory and elevating action, some of the hail-stones are thrown against each other and broken; and each successive layer of congelation may often be seen in the fractured sections of the hail. In all vorticular condensations of this character, when the cold is not sufficiently intense to produce hail, drops of rain are produced of a much greater size than are ever found in a common and direct fall of rain.

Hail storms of this character are less frequent in the tropical regions than in the temperate latitudes, for the reason, probably, that a stratum of sufficient cold to produce the hail is seldom found so near the inferior stratum, that a vorticular communication can be established with the former, by means of an ordinary gust, spout, or whirlwind. Nor does this ordinarily happen in the temperate latitudes; but only when the lower warm stratum becomes overlaid, in close proximity, by a stratum from a colder region; an event which is not unfrequent in most countries within the temperate latitudes. It commonly happens, therefore, that several hail storms, of greater or less magnitude and violence, occur on the same day, or about the same period.

Of Thunder Storms and Gusts.

When a cold stratum or current of the upper atmosphere moves or rests upon a warm one which is next the earth, neither stratum, as such, can penetrate or displace the other. Nor can a sudden interchange or commingling take place between the masses or particles of which these strata are composed, except by the slow and tedious process of the successive action and convolution of single particles, or small groups of particles, upon or around each other; but if a communication or interchange between the two strata becomes established by means of the action of a gradually excited whirlwind or water-spout, or if, owing to any inequality of surface or other accident, a depression is made upon the lower stratum, so as to enable the colder air to descend at this point, then an immediate gyration or convolution will take place in the two masses at this point, the warm air rising as it becomes displaced, and a copious condensation will immediately follow. It is movements of this character which produce the dense and convoluted appearance known as a thunder cloud, and the thunder and lightning, rain, and perhaps hail, follow as necessary results.

The precipitation of the colder stratum thus commenced, is regularly continued and enlarged till an equilibrium is produced, and the thunder storm thus engendered, assumes, of course, the direction of the upper current to which it is appended, and which, in the temperate latitudes, is commonly from the western quarter. The warm surface air which is thus displaced at the commencement of the process, rises immediately in front of the colder intruding mass, and by the gyratory action thus commenced becomes convoluted in detached masses or layers, with the colder surrounding air, and by the reduction of temperature thus produced, furnishes the large supply of aqueous vapor which is first condensed in the heavy thunder cloud, and then precipitated in a heavy fall of rain; and the electric phenomena which are induced by this sudden contact or intermingling of masses of air of different temperatures and hygrometric conditions, become highly vivid, and too often destructive. The active gyration which is commonly produced within the body of the thunder storm or gust, is in the direction of the advance of the storm, and of the rising warm air which is forced upward, or in the direction of forward and upward at the lower front of the storm.

In consequence of this gyratory action, a storm which advances at the rate of fifteen or twenty miles an hour, is often known to exhibit a velocity of wind during the period of its greatest violence, of sixty or eighty miles an hour. If the axis of this gyration in a thunder storm assumes, from any cause, a vertical position, we then have a perfect whirlwind or tornado, which, if it be so situated as not to reach the earth by its direct action, will exhibit to us the phenomena of a heavy thunder storm accompanied by rumbling sounds and concussion, and a fall of hail in or near some portion of its path. But if the regular action of the whirlwind should reach the earth, and continue for some time, great destruction may be expected to follow. The path of these destructive whirlwinds is generally narrow, and often but a few hundred yards in width.

From the nature of the causes which we have set forth as being favorable to the occurrence of a thunder storm, it follows that many of these storms will be likely to occur on the same day, in different parts of the same country, as has been already remarked in the case of hail storms, with which they are often identical; and the writer has often found this to be true to a remarkable extent. The fatal accidents by lightning, in different parts of the country, have often happened on the same days, and we have reason to believe that scores of tornadoes, hail storms, and thunder storms, have sometimes occurred on the same afternoon. It usually happens that the precipitations of colder atmosphere at these numerous points of disturbance is sufficient to produce a marked change in the temperature of the surface stratum within a period of twelve hours thereafter.

Atmospheric disturbances of this kind, which do not produce violent thunder or hail, are usually denominated *squalls*; and it appears highly probable that the presence of air of a temperature considerably above the freezing point is necessary to the production of thunder and lightning. In the Strait of Magalhaens, in Patagonia, where the air at the surface is neither warm nor yet very cold, the squalls, called by the sailors, williwaws, are very frequent, and tremendously severe; but, according to the observations of Capt. P. P. King, lightning and thunder are seldom known.

The heavy condensation presented in a thunder cloud is often spoken of in a manner which implies that the cloud possesses some mechanical or other energy, by means of which the violent wind is sent forth; but nothing can be more unreal than such a supposition. The cloud may indeed be the means of electric development, and furnishes also the watery deposition for the hail or rain, but all the particles of the cloud are passively inert, like those of a common fog or mist, and the violent winds and disturbing forces which may be present, operate to produce the cloud, but do not, in any important sense, result from its action.

Water-spouts and Whirlwinds.

The character of these meteors has already been described, in a measure, in our account of hail and thunder storms. The identity of whirlwinds and water-spouts was maintained by Franklin, and although at a later period this has been called in question, it appears to have been done without sufficient reason.

From the equal distribution of the atmosphere as the oceanic envelope of our earth, it results, that no movement of great violence can take place in any of its parts, except by means of a direct circuit of rotation in the form of a vortex or active whirlwind.

A vortex will not be regularly formed, nor continue itself in action, without the aid of an external propelling force, and a constant spiral discharge from that extremity of its axis towards which is the tendency of motion. Both these conditions, it is believed, are fulfilled to the letter in the case of a common whirlwind or water-spout. The air at the upper extremity of the whirling column, owing to its elevation, is rarer than at the base, and the column itself, particularly in its central portions, is mechanically rarified by the centrifugal effect of its own whirling motion. We have thus a sort of rarified chimney into which the denser air at the base of the column is continually forced by the pressure of the surrounding atmosphere; not to ascend in a separate current, as in the common chimney, but entering into the organization of the whirling vortex, to supply the place of the preceding portions of air which are winding inwards and upwards to be again discharged at the upper extremity. The condition of force by which the propulsion is maintained, is found in the pressure of the surrounding atmosphere upon all sides of the mechanically rarified column, and if the expansive whirling motion be sufficiently active to produce nearly a vacuum at the centre, the external propelling force will be nearly fifteen pounds to the square inch; and as the whirling column turns within its own compass like a top or any other rotative body, this force is quite sufficient to account for all the violence that is ever produced.

Were there no vorticular or whirling action already excited, and no discharge from the upper extremity of the vortex, the external pressure, it is true, could not produce rotation; but this movement and upward discharge having once commenced, from any cause, the particles near the exterior of the column, like those of water in a funnel, yield at a little more than a right angle, to the external pressure, in their spirally approximating course towards the rarified centre. By the slowness of this central approximation as compared with the whirling action, the intensity or magnitude of the external pressure becomes merged in the velocity of the rotative action. As the area of the spiral circuit decreases rapidly as we approach the centre, it follows that the velocity of the whirling movement must be proportionably increased, as we perceive it to be in the funnel and in all regular formed vortices. Thus, if the rotative velocity near the exterior of a column be at the rate of but ten miles an hour, at one-third nearer the centre, the velocity must be more than doubled, and at two-thirds of the distance from the first named point to the centre, the absolute whirling velocity must be increased nine fold, which in this case is equal to ninety miles an hour; and in consequence of the reduced diameter of the circuit of gyration, at the last point, the number of revolutions must here be as four hundred, to one of the point first mentioned. The increased ascending velocity, however, is not here taken into account, which may perhaps reduce the number of comparative revolutions in the central portions of the column. The condensing and electric effects which often attend or follow these active whirlwinds, have been cursorily noticed under the head of thunder-storms.

It is not intended to dwell here upon the causes by which whirlwinds and spouts are excited or first set in motion, but the local disturbance of heat is probably the chief exciting cause as in thunder-storms. The agency of heat may also be effective in continuing the upward discharge and vorticular organization, in cases where there is great disparity in the temperatures of the air at the upper and lower extremities of the whirling mass or column, but it is to the mechanical expansion of the centrifugal action and the powerful impulse of the atmospheric pressure, that the increase and powerful activity of the whirlwind is chiefly to be referred,

The term *water-spout* is undoubtedly a misnomer, as there is no effect produced of which this term is probably descriptive, although the term air-spout would not be greatly inappropriate. The visible column of condensed vapor which often appears in the rarified centre of the vortex when the latter is not enveloped in cloud, has probably given name to this meteor. But the water of the sea is not taken up by the spout or whirlwind, except in a slight degree and in the form of fine spray, like other light matter which is swept from the surface. This cloudy stem or column frequently appears and disappears, while the action of the whirlwind continues without any important change. Owing to this fact, observers sometimes believe that they witness the commencement of a water-spout, or tornado, when the same has previously been in action for one or more hours, and when the cloudy pipe or pillar happens to disappear the spout is supposed to have 'burst,' while, often, it has undergone no important change, except, perhaps, a

slight decrease in its activity. The active and violent portion of the whirlwind surrounds the spout invisibly, and is probably of much greater diameter at a distance from the surface of the earth than at the base of the spout. Thus, when a spout or whirlwind has passed near a ship, the upper spars have been converted into wreck while no violence of wind was felt on the deck.

Water-spouts follow the course either of the surface wind or of the higher current with which they may communicate, or their course may be modified by both these influences without being absolutely determined by either. They abound most, however, in those calm regions which are found at the external limits of the trade winds, and in the regions near the equator.

It has been common to ascribe whirlwinds and water-spouts, as well as larger whirlwind storms, to an impulse produced by the meeting of contrary currents, but the laws of distribution and of motion in an oceanic body, are such as do not permit the movements of its different currents and gyrations to meet in conflict with each other, besides any conflicting movement in the air would necessarily produce a rise in the barometer, whereas it is generally known to fall at the commencement of a storm, either of large or small extent. We may observe, also, that whirlwinds and spouts appear to commence gradually, and to acquire their full activity without the aid of foreign causes: besides, it is well known that they are most frequent in those calm regions where, apparently, there are no active currents to meet each other, and they are at least frequent where currents are in full activity.

Of Trade Winds and the circuitous Character of the Atmospheric Currents.

It is found that in almost every country, and in every sea, the wind is more or less predominant in a particular direction. In open sea, between the equator and the 30th parallel of north and south latitudes, the wind, for the most part, blows from the eastward; but near the eastern borders of any ocean, below these latitudes, the wind blows in a direction more towards the equator than in its central or western portions.

In the higher latitudes north of 30°, the westerly winds are found greatly to predominate, although the eddying or rotative action which is acquired by large portions of the lower stratum of air in these latitudes, causes much diversity and frequent changes in the initial direction of the wind. But in the common region of clouds where this eddying movement is less frequent, the main atmospheric current, at least in the United States, is fully as constant from the westward as is the trade wind from the eastward in any tropical region.

At New York, in four successive years, the westerly winds have been found to be to the easterly, as nearly two to one. Observations on the courses of the clouds for the same period, show the prevalence of an atmospheric current from the westward at that elevation to be, as compared with those from the eastward, nearly as fourteen to one; the prevailing wind being south-westerly. At Montreal, in Lower Canada, as appears by the observations of J. M'Cord, Esq., the westerly surface winds also appear to exceed the easterly, in the proportion of more than four to one. In consequence of the general prevalence of westerly winds and currents in these latitudes, the passages of the fastest ships, from Europe to America, are found to occupy a much longer period than from America to Europe.

The first movement of the trade winds towards the equator and westward, necessarily occasions an equal movement from the higher latitude to supply their place; and as the trade winds in their progress westward are opposed by the American and Asiatic continents, across which these winds do not pass, it follows that these winds become deflected or thrown off towards the poles in order to support an equal distribution of the atmosphere in the higher latitudes; but the air thus transferred to these latitudes, carries with it the rotative impulse which it acquired in the tropical latitudes, and by reason of the slower rotative motion which here prevails, is thrown to the eastward in the form of westerly winds.

An entire circuit of atmospheric currents is thus maintained on both sides of the equator, the most equable and determinate portion of which is to be found in the region of the trade winds; and this appears to be the general outline of the great system of circulation in our atmosphere, as well as in the ocean itself. It is to the geographical course pursued by the winds in different portions of these great circuits, that the peculiarities of temperature and climate pertaining to different countries lying in the same latitudes, are chiefly to be referred, as also the remarkable absence or predominance of *rain* which is peculiar to certain regions.

The monsoons of the Indian Seas are but a modification of the same system of circulation; the regular trade wind, instead of turning towards the higher latitudes, being here deflected across the equator, where it returns to the eastward in the form of the *westerly* monsoons; the *easterly* monsoons being the regular trade wind. The monsoons have, indeed, been ascribed to local refraction in Asia and New Holland, but the north

westerly monsoon, regardless of this hypothesis, sometimes sweeps over half the breadth of the great Pacific in its eastwardly progress.

The foregoing generalization may also be expressed in the following form:

I. Between the two paralells of 30° N. and S. the atmosphere at the earth's surface, for the most part, revolves around the axis of the earth with a slower motion than the earth's crust, or is constantly being left behind in the movement of rotation.

II. The space previously occupied by the atmosphere so left behind, is by the centrifugal action of the earth's rotation, constantly supplied from the higher latitudes.

III. That portion of the atmosphere which is left behind in the tropical latitudes, and passes westward by the earth's rotation, as above described, is, by the force of direct gravitation, constantly transferred to the higher latitudes; thus preserving the equilibrium of distribution, so far as the same is ever maintained in these latitudes.

IV. That portion of the atmosphere which is so transferred to the higher latitudes after having acquired the high rotative velocity of the equatorial regions, is, by this previously acquired impulse, thrown rapidly eastward in the form of westerly winds, thus completing the great circuit of perpetual gravitation, which is developed in each of the oceanic basins on both sides of the equator.

It is by the currents of these natural circuits of gravitation, that hurricanes and storms are found to be transported from one region or locality to another; and the track of these storms affords demonstrative evidence of the predominating course which these currents pursue. The currents themselves often become modified in their apparent courses from various causes, and being often stratified, or as it were *shingled* upon each other, they exhibit in their crossings, initial movements in different directions, and frequent changes at the surface, while still performing with no little regularity the systematic courses which have been summarily pointed out. One obvious cause of the irregularity and superposition of these currents is found in the retardation to which the lowest portions are subject, owing to the resistance of the earth's surface.

The rotative motion of the atmosphere and the earth's surface in the latitudes between the trade winds and the returning westerly winds being nearly equal, this region is necessarily subject to calms, and to those sudden gusts and squalls which are usually excited in warm regions in the absence of a prevailing wind. This region, in the North Atlantic, is known to navigators as the *horse latitudes*, because the traders between New England and the West Indies, in consequence of the lack of sustenance occasioned by these calms, were sometimes under the necessity of throwing overboard the whole or a part of their deck loads of horses. The great circuits of winds intersect and cross these latitudes in both directions on almost every meridian, but with little sensible effect at the surface, except towards the eastern margin of the Atlantic, where the northerly winds decidedly prevail; and towards the western margin of the Atlantic and in the Gulf of Mexico, the southerly winds are usually prevalent.

Similiar results are found in nearly all the regions which separate the great natural circuit of winds from each other, and these tracts of ocean are known by the designation of *the calms*, and sometimes are called the *rains* or the *variables*. Such is the region about the equator, which separates the northern from the southern trade winds, and the easterly from the westerly monsoons. The easterly monsoons in approaching the equator, where they run into the westerly monsoons, necessarily acquire the same velocity of rotation as the earth's crust, which of course produces calms; the northerly or southerly tendency of the monsoons being here too small to produce a leading breeze at the surface.

Land and Sea Breezes.

Near the shores of an island or country it is often found that the wind, during different hours of the day and night, blows alternately to and from the land. Or in the case of a general or trade wind which is parallel to the coast, its course becomes alternately modified by an approximation to the above result. This effect has probably been ascribed to the influence of diurnal heat and cold. Not that any vacuum is created by the heat into which the surrounding air rushes, as has sometimes been supposed; for, aside from the general error of this notion, a flat, low, and strongly heated island or coast, has less effect in producing these breezes than a high sloping country of more even temperature.

The truth appears to be, that when the stratum, which lies upon the inclined surface of a coast becomes warmed and rarified by the daily heat, it is forced by the increment of pressure at its lowest margin to move along the inclined surface in the direction of greatest elevation, or as near that direction as the prevailing tendency of the lower current will allow. Owing to the cooling process which goes on during the night, the specific gravity of the inclined stratum becomes predominant, and the reverse movement then commences and continues into the following morning. We find, too, that on the slopes of certain coasts and islands where there is sufficient elevation, the higher margin of this stratum, at certain seasons, will daily reach an altitude at which it is brought in

contact with a higher stratum sufficiently cold to set in operation a squall or thunder storm, at a certain hour; after which, the equilibrium is restored, and the usual counter movement again follows in its turn.

Some diurnal effect of this kind upon the wind is observed at times in almost every region; and, taken altogether, it is probably the most extensive agency which is exercised by heat in the production of winds.

OBSERVATIONS

ON THE

HURRICANES AND STORMS OF THE WEST INDIES AND THE COAST OF THE UNITED STATES.

BY W. C. REDFIELD.

From a careful attention to the progress and phenomena of some of the more violent storms which have visited the Western Atlantic, I have found that they exhibit certain characteristics of great uniformity. This appears, not only in the terminate course which these storms are found to pursue, but in the direction of wind, and succession of changes which they exhibit while they continue in action. The same general characteristics appear also to pertain, in some degree, to many of the more common variations and vicissitudes of winds and weather, at least in the temperate latitudes. The following points I consider as established:

1. The storms of greatest severity often originate in the tropical latitudes, and, not unfrequently, to the eastward of the West India Islands; in the tropical regions they are distinguished by the name of *hurricanes*.

2. These storms cover, at the same moment of time, an extent of contiguous surface, the diameter of which may vary in different storms, from one hundred to five hundred miles, and in some cases they have been much more extensive. They act with diminished violence towards the exterior, and with increased energy towards the interior, of the space which they occupy.

3. While in the tropical latitudes, or south of the parallel of 30°, these storms pursue their course, or are *drifted* by the natural atmospheric current of the region towards the west, on a track which inclines gradually to the northward, till it approaches the latitude of 30°. In the vicinity of this parallel, their course is changed somewhat abruptly to the northward and eastward, and the track continues to incline gradually to the east, towards which point, after leaving the lower latitudes, they are found to progress with an accelerated velocity.

The rate at which these storms are found thus to advance in their course, varies in different cases, but may be estimated at from 12 to 30 miles an hour. The extent to which their course is finally pursued, remains unknown; but it is probable that as they proceed, they become gradually extended in their dimensions, and weakened in their action, till they cease to command any peculiar notice. One of the hurricanes of August, 1830, has been traced in its daily progress, from near the Caribbee Islands to the coast of Florida and the Carolinas, and from thence to the banks of Newfoundland, a distance of more than three thousand miles, which was passed over by the storm in about six days. The duration of the most violent portion of this gale, at the different points over which it passed, was about 12 hours, but its entire duration was in many places more than twice that period. Another hurricane which occurred in the same month, passed from near the Windward Islands, on a more eastern but similar route, and has also been traced in its daily stages by means of the journals and reports of voyagers, near two thousand five hundred miles. It was in this storm that the Russian Corvette, Kensington, Captain Ramsey, suffered so severely. The hurricane of August, 1831, which desolated the Island of Barbadoes on the 10th of that month, the daily progress of which has also been ascertained, passed in nearly a direct course to the northern shores of the Gulf of Mexico and New Orleans, where it arrived on the 16th of the same month, having passed over a distance of twenty-three hundred statute miles in 6 days after leaving Barbadoes.* Many cases of like character might be adduced.

4. The duration of the storm, at any place within its track, depends upon its extent and the rate of its progressive velocity, as these circumstances are found to determine the time which is required for the storm to pass over any given locality falling within its route. Storms of smaller extent, or dimensions, are usually found to move from one place to another with greater rapidity than larger storms.

5. The course thus pursued by the storm, is found to be entirely independent of the direction of wind which it may exhibit at the different points over which it passes—the wind in all such storms being found to blow after the manner of a whirlwind, around a common centre or vortex, during their entire progress, and in a determinate direction or course of rotation, which is from *right* to *left* (or in the direction from west to south) horizontally. The direction of the wind, therefore, for the most part, does not coincide with the course of the storm.

* The tracks of these and other hurricanes appear on the annexed chart.

6. In the lower latitudes, while drifting to the westward, the direction of the wind at the commencement, or under the most advanced portion of these storms, is from a *northern* quarter, usually at some point from north-east to north-west, and during the latter part of the gale, it blows from a southern quarter of the horizon, at all places where the whole effect of the gale is experienced.

8. After reaching the more northern latitudes, and while pursuing their course to the northward and eastward, these storms commence with the wind from an eastern or southern quarter, and terminate with the wind from a western quarter, as will appear more distinctly under the three following heads, the latter portion of the storm being usually attended with broken or clear weather.

8. On the outer portion of the track, north of the parallel of 30°, or within that portion of it which lies *farthest* from the American coast, these storms exhibit at their commencement a *southerly* wind, which, as the storm comes over, *veers gradually to the westward*, in which quarter it is found to terminate.

9. In the same latitudes, but along the *central portions of the track*, the first force of the wind is from a point near to *south-east*, but after blowing for a certain period, it *changes suddenly*, and usually after a short intermission, to a point nearly or directly opposite to that from which it has previously been blowing, from which opposite quarter it blows with equal violence till the storm has passed over, or has abated. This sudden change of a south-easterly wind to an opposite direction, *does not occur towards either margin of the storm's track*, but only on its more central portion, and takes effect in regular progression along this central part of the route, from the *south-west* towards the *north-east*, in an order of time which is exactly coincident with the progress of the storm in the same direction. It is under this portion of the storm that we notice the greatest fall of the barometer, and the mercury usually begins to rise a short time previous to the change of wind. In this part of the track, the storm is known as a *south-easter*, and is usually attended with rain previous to the change of wind, and perhaps for a short time after.

10. On that portion of the track which is *nearest* the American coast, or which is farthest inland if the storm reaches the continent, the wind commences from a more eastern or north-eastern point of the horizon, and afterwards veers more or less gradually, by north, to a north-western or westerly quarter, where it finally terminates. Here also the first part of the storm is usually, but not always attended with rain, and its latter or western portion with fair weather. The first or foul weather portion of the storm, is on this part of its track, recognized as a *north-easter*.

It should be noted, however, that near the latitude of 30°, and on the shores of Carolina, where the storm enters obliquely upon the coast, while its track is rapidly changing from a northwardly to an eastwardly direction, the wind on the central track of the storm, will commence from an eastern or north-eastern point of the compass, and will gradually become south-easterly as the storm approaches its height.

11. A full and just consideration of the facts which have been stated, will show conclusively that the portion of the atmosphere which composes for the time being the great body of the storm, whirls or blows as above stated, in a horizontal circuit, around a vertical or somewhat inclined axis of rotation which is carried onward with the storm; that the course or direction of this circuit of rotation is from *right* to *left*; and that the storm operates nearly in the same manner as a tornado or whirlwind of smaller dimensions; the chief difference being in the more disk-like form of the whirling body and the magnitude of the scale of operation.* This view of the subject, when fully comprehended, affords a satisfactory solution of the otherwise inexplicable phenomena of storms, and will also be found to accord entirely with the fact which appears in the above statement, that in the phases or changes which pertain to a storm, the wind, on one margin of its track, veers *with the sun*, or from *left* to *right*, while under the opposite margin of the same storm it veers *against the sun*, or from *right* to *left*; for this peculiarity necessarily attends the progressive action of any whirlwind which operates horizontally.

12. Owing to the centrifugal action of these rotative storms, the barometer, whether in the higher or lower latitudes, always sinks while under the first portion or moiety of the storm on every part of its track, excepting, perhaps, its extreme outward margin, and commonly affords us the earliest and surest indication of the approaching tempest. The mercury in the barometer always rises again during the passage of the last portion of the gale, and commonly attains the maximum of its elevations on the entire departure of the storm.

The great value of the barometer to navigators is becoming well understood, and its

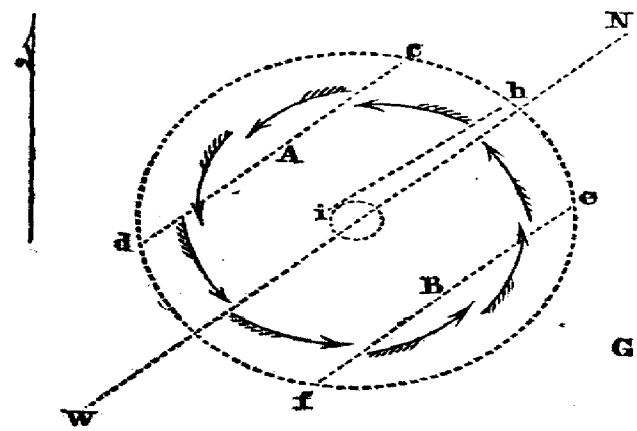
* It is to be understood that the diameter of the whirlwind which constitutes the storm is commensurate with the width of the track over which the storm passes. The main body of the storm is supposed to move in the form of an extensive disk, whirling around its own centre as it advances in its regular track—with this difference, that the rotative movement is far more rapid in the interior portions of the whirling body, than towards its exterior limits.

practical utility might be greatly increased by hourly entries of the precise height of the mercurial column, in a table prepared for the purpose. Its movements, unless carefully recorded, often escape notice or recollection; which may easily happen at those times when a distinct knowledge of its latest variations might prove to be of the greatest importance.

In the foregoing statements our design has been to designate in a summary manner the principal movements which, in these regions at least, constitute a storm; and we do not attempt to notice the various irregularities, and subordinate or incidental movements and phenomena of the atmosphere with which a storm may chance to be connected, or which may necessarily result from such violent movements in a fluid which is so tenuous and elastic in its character. It may be remarked in general, that the most active or violent storms are usually the most regular and uniform in the development of those characteristic movements which we have already described. It is also probable, that the vortex or rotative axis of a violent gale or hurricane, oscillates in its course with considerable rapidity, in a moving circuit of moderate extent, near the centre of the hurricane; and such an eccentric movement of the vortex may, for ought we know, be essential to the continued activity or force of the hurricane. Such a movement will fully account for the violent *flaws* or *gusts* of wind, and the intervening *lulls* or remissions, which are so often experienced towards the heart of a storm or hurricane, when in open sea; but of its existence we have no positive evidence.

In Purdy's Memoir of the Atlantic Ocean, it is stated "that while one vessel has been lying to in a heavy gale of wind, another, not more than 30 leagues distant, has at the very same time been in another gale equally heavy, and lying to with the wind in quite an opposite direction."

This statement is obviously to be understood as applicable to two vessels falling under the two opposite sides or portions of the same storm, where the wind in its regular circuit of rotation must, of course, blow from the opposite quarters of the horizon. We will suppose one of the vessels to be at A and the other at B, in the annexed figure.



The storm in pursuing its course from W. towards N., will strike the first mentioned vessel in the direction which is shown by the wind-arrows at the point *c*, which, if the position be in the temperate latitudes, north of 30°, will be from eastward. Now, it is obvious, that as the storm advances in its course north-eastward, this vessel, if nearly stationary, will intersect the body of the gale on the line *c* A *d*. As the storm advances, the wind must also veer to the northward, as shown by the arrows, being at N. E. when the vessel is brought under the point A, and near the close or departure of the storm by its further progress eastward, the wind will have further veered to the direction shown at *d*, which, with due allowance for the progressive motion of the storm, we will set down at N. N. W. The other vessel, as is equally obvious, will first take the wind from the southward, as shown at *e*, in which quarter it will blow, with no great variation, till, by the advance of the storm, the ship is brought under the point B. The barometer, which had previously been falling, will now commence rising, and the wind, veering more westerly, will at the departure of the storm, be found in the direction shown at *f*, which, after the allowance already referred to, may be stated at W. N. W. Such, substantially, are the facts commonly reported by vessels which fall under the lateral portions of the Atlantic storms, and it is readily seen, that the opposite winds which are exhibited on the two different intersections of the storm, as above described, will very naturally be mistaken for two separate and distinct gales.

The phases of the wind in these gales are, however, in all cases modified more or less by the course or changing position of the vessel exposed to its action. For example; a ship on taking the gale, say at E. S. E. at the point *h*, on the figure, and lying to with her head to the northward, may by that means be brought to intersect the storm on the line *h i*, and, at the point *i*, would suddenly be taken aback, with the wind, say at N. N. W., as in the case of the Jamaica homeward-bound fleet in 1782, and the barometer, which reaches its lowest depression under the central portion of the storm, would about this period be found to have commenced rising with some degree of rapidity.

A further reference to the figure will show that a ship, which may be at the point G during the passage of the gale, would be exposed to a heavy swell from the southward

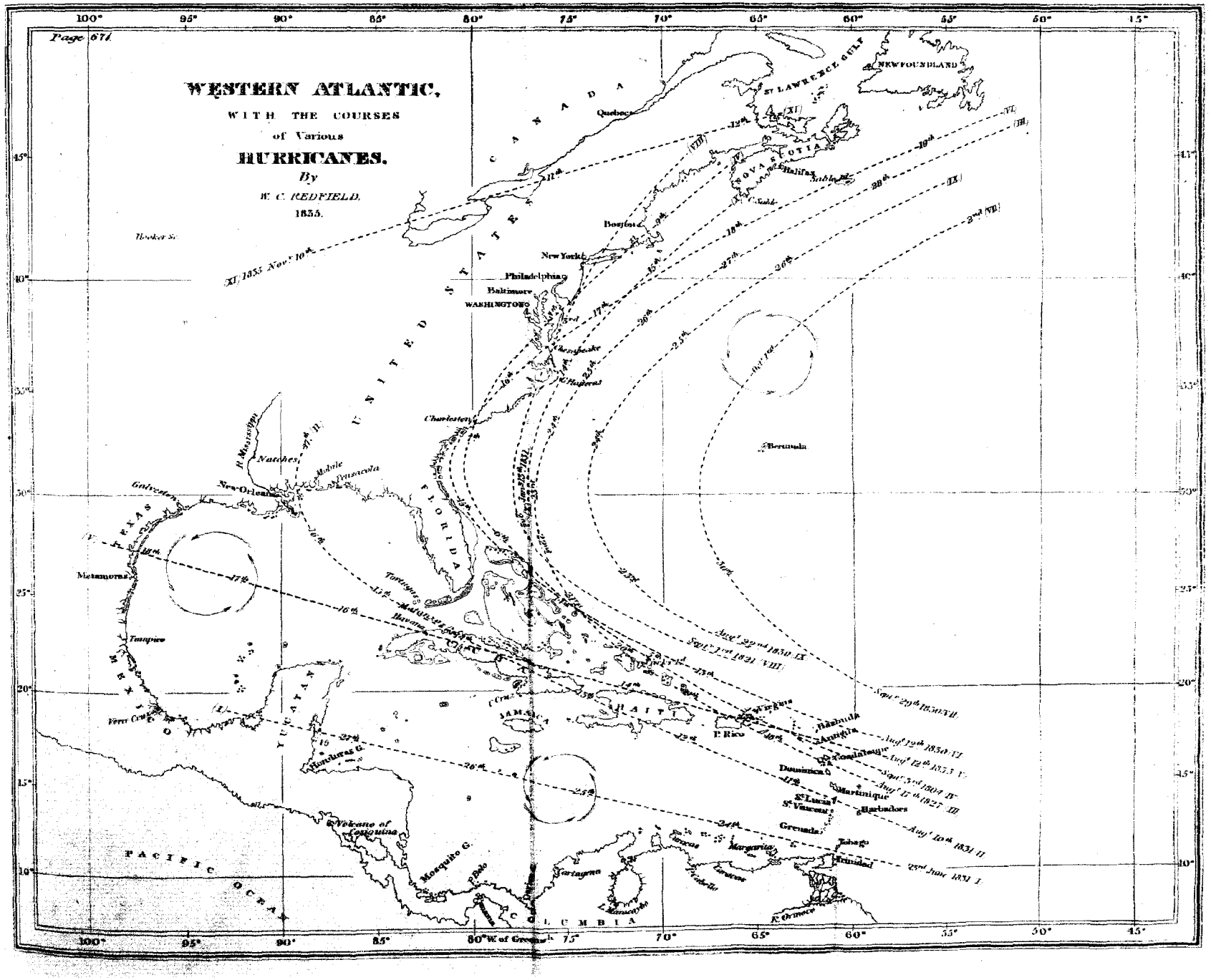
and westward; but, being beyond the organized limits of the storm, may remain entirely unaffected by the violence of the wind, which at the same time may be raging with destructive fury at the distance of a few leagues. The writer has knowledge of many such examples.

It has been suggested that "the larboard tack is the proper one to lie to on, as the wind will then be found to draw aft;" but this will frequently prove erroneous, as the wind may draw either way, on either tack, according to the position and course of the ship, in the storm, and the extent and rate of progress of the latter. In the case of the fleet which encountered the gale of 1782, it was probably the best course to carry sail to the northward at the very commencement of the gale, and as far and as long as possible.—By this means the fleet might, perhaps, have been drawn as far northward as the point A on the figure, and the change of wind to the northward and westward would have been rendered more gradual. The chief difficulty and danger, is when the direction of the wind at the first setting in of the gale, is found to be nearly at right angles with the known course of the storms in the region where the gale is encountered, and it is then desirable to pursue such a course as to avoid, if possible, falling into the heart of the storm.

It frequently happens that a storm, during the first part of its progress over a given point, fails to take effect upon the surface, while it exhibits its full activity at a greater altitude. This commonly happens when this portion of the storm arrives from, or has recently blown over a more elevated country, or is passing or blowing from the land to the sea. On land, the most violent effects are usually felt from those storms which enter and blow from the open ocean upon the shores of an island or continent. Upon the latter, under such circumstances, the *first* part of the gale is usually the most severe, and that coast of an island upon which a storm first enters, or blows, also suffers most from the early part of the gale, but its later, or receding part, often acts with the greatest fury upon the opposite side of the island, which had previously derived some degree of shelter from the intermediate elevations and other obstacles opposed to the force of the wind, the benefit of which is now lost by its counter direction from the open ocean. Owing to similar causes, the force of the storm is sometimes very unequal at different places, situated in nearly the same part of its track, and such inequality, as we have before intimated, necessarily pertains to two places, one of which is near the centre and the other towards the margin of the route.

Of the multitude of facts by which these views might be illustrated, we will only state, that in the late hurricane at Barbadoes, (that of August, 1831,) the trees near the northern coast of that island, lay from N. N. W. to S. S. E., having been prostrated by a northerly wind in the earlier part of the storm, while in the interior and some other parts of the island, they were found to lay from south to north, having fallen in the later period of the gale. That after the same hurricane, advices that were received from the islands of St. Croix and Porto Rico, (which lay near the northern margin of its track,) stated that no hurricane had been experienced at these islands; but it afterwards appeared that some portions of these islands had suffered damage from this hurricane in the night of the 12th to 13th of August, two days after it passed over the Island of Barbadoes.—That the sea-islands which border the coast of Georgia and the Carolinas, are known to suffer greatly from these tempests, while little or no injury is sustained in the interior at the distance of a few miles from the coast. One of the most striking characteristics of these storms, is the *heavy swell* which in open sea is often known to extend itself on both sides of the track, entirely beyond the range of the gale by which it was produced. The last hurricane to which we have alluded, threw its swell with tremendous force upon the northern shores of Jamaica, having passed to the northward of that island.

So strong is the influence of our established modes of thinking on this subject, that it seems to be difficult, even for those who admit the rotative character of these hurricanes, to understand correctly the true bearing and relations of the different phases of the wind, which are presented at two or more points or places visited by the same storm, unless the subject has been thoroughly and carefully studied. Speculative opinions, also, upon the course of a storm, are usually, if not always, founded upon the erroneous notion of a rectilinear course in the wind. In the accounts received of the hurricane at Barbadoes, on the 3d September, 1835, which raged for a few hours from E. N. E., fears were expressed for the safety of the islands to the northward; but subsequent intelligence from Guadaloupe and Martinico showed that the gale had not extended to these islands. Had the direction and changes of the wind in this storm been viewed in their true relations, it would have been perceived that the heart of the gale must have passed to the southward of Barbadoes; and, as a general rule in the West India latitudes, where the onset of the storm is found to be in the general direction of the trade wind, or more eastward, the observer may consider himself as under the northern verge of the gale; but if the onset of the gale be from north-westward, veering afterwards by west to the south-


Page 671
WESTERN ATLANTIC,
WITH THE COURSES
of Various
HURRICANES.
By
W. C. REDFIELD.
1835.
CANADA
UNITED STATES
NEW FOUNDLAND
ST LAWRENCE GULF
NOVA SCOTIA
Quebec
Halifax
Sable I.
Boston
New York
Philadelphia
Baltimore
WASHINGTON
Charleston
Natchez
Mobile
Pensacola
New Orleans
Galveston
TEXAS
FLORIDA
Matanzas
Havana
Tortugas
Tampico
Vera Cruz
YUCATAN
JAMAICA
HAITI
P. Rico
Bermuda
Anegada
Guadaloupe
Dominica
Martinique
St Lucia
St Vincent
Barbados
Grenada
Tobago
Trinidad
Margarita
Curacao
Cartagena
Volcano of Cosguina
Mosquito C.
Honduras G.
PACIFIC OCEAN
COLUMBIA
XI 1835 Nov 10th
Aug 22nd 1830 IX
Sept 7th 1821 VIII
Sept 29th 1830 VII
Aug 12th 1830 VI
Aug 12th 1833 V
Sept 5th 1804 IV
Aug 17th 1827 III
Aug 10th 1831 II
25th June 1831 I
100°
95°
90°
85°
80°
75°
70°
65°
60°
55°
50°
45°
40°
35°
30°
25°
20°
15°
10°
80° W. of Greenwich

ern quarter, the heart of the storm will be found to have passed to the northward of the point of observation, the latter being under the southern margin of the gale.

In order to illustrate the foregoing statements, I annex a chart of the Western Atlantic, on which is delineated the route of several hurricanes and storms, as derived from numerous accounts which are in my possession, by which their progress is specifically identified from day to day, during that part of their route which appears on the chart.

The route designated as No. I, is that of the hurricane which visited the islands of Trinidad, Tobago, and Grenada, on the 23d June, 1831. Pursuing its course through the Caribbean Sea, it was subsequently encountered by H. M. schooner Minx, and other vessels, and its swell was thrown with great force upon the south-eastern shores of Jamaica, on the 25th, while passing that island, where the wind, at this time, was light from the northward. After sweeping through the Caribbean Sea, this hurricane entered upon the coast of Yucatan, on the night of June 27th, having moved over the entire route from Trinidad to the western shore of the Bay of Honduras in a little more than one hundred hours, a distance of about seventeen hundred nautical miles, which is equal to nearly seventeen miles an hour. I have no account of this storm after it crossed the peninsula of Yucatan, and it is probable that it did not again act with violence upon the ocean level. Its course of track to Honduras was N. 74° W.

Track No. II is that of the memorable hurricane which desolated Barbadoes on the night of August 10, 1831, and which passed Porto Rico on the 12th, Aux-Cayes and St. Jago de Cuba on the 13th, Matanzas on the 14th, was encountered off the Tortugas on the 15th, in the Gulf of Mexico on the 16th, and was at Mobile, Pensacola, and New Orleans on the 17th; a distance of 2,000 nautical miles in about 150 hours, equal to something more than 13½ miles an hour.* Its course, until it crossed the tropic of Cancer, was N. 64° W., or W. N. W., nearly. In pursuing its northern course, after leaving the ocean level, it must have encountered the mountain region of the Alleganies, and was perhaps disorganized by the resistance opposed by these elevations. It appears, however, to have caused heavy rains in a large extent of country lying north-eastward of the Gulf of Mexico.

Track No. III is that of the destructive hurricane which swept over the Windward Islands on the 17th of August, 1827; visited St. Martin's and St. Thomas on the 18th; passed the north-east coast of Hayti on the 19th; Turk's Island on the 20th; the Bahamas on the 21st and 22d; was encountered off the coast of Florida and South Carolina on 23d and 24th; off Cape Hatteras on the 25th; off the Delaware on the 26th; off Nantucket on the 27th; and off Sable Island and the Porpoise Bank on the 28th. Its ascertained course and progress is nearly 3,000 miles,† in about eleven days; or at the average rate of about eleven miles an hour. The direction of its route, before crossing the tropic, may be set down at N. 61° W., and in latitude 40° while moving eastward, at N. 58° E.

Track No. IV is that of the extensive hurricane of September, 1804. It swept over the Windward Islands on the 3d of that month; the Virgin Islands and Porto Rico on the 4th; Turk's Island on the 5th; the Bahamas and Gulf of Florida on the 6th; the coast of Georgia and the Carolinas on the 7th; the great bays of Chesapeake and Delaware, and the contiguous portions of Virginia, Maryland, and New Jersey, on the 8th; and the states of Massachusetts, New Hampshire and Main, on the 9th; being on the highlands of New Hampshire a violent snow-storm. The destructive action of this storm was widely extended on both sides of the track indicated upon the chart, and the same fact pertains, in a greater or less degree, to the other storms herein mentioned. It appears to have passed from Martinico, and the other Windward Islands, to Boston, in Massachusetts, by the usual curvilinear route, in about 6 days; a distance of more than 2,200 miles, at an average progress of about 15½ miles per hour.

Track No. V represents the route of the hurricane which ravaged the Islands of Antigua, Nevis, and St. Kitt's, on the night and afternoon of August 12th, 1835; St. Thomas, St. Croix, and Porto Rico on the 13th; Hayti and Turk's Island on the 14th; the vicinity of Matanzas and Havana on the 15th; was encountered off the Tortugas, in the Gulf of Mexico, on the 16th; in lat. 27° 21′, long. 94°, and other points, on the 17th and 18th; and also at Matamora, on the coast of Mexico, (lat. 26° 4′,) on the 18th, where it was most violent during the succeeding night.‡ This storm is remarkable, as moving

* Mr. Purdy states that this gale was felt at Natchez, 300 miles up the Mississippi.

† All the distances are expressed in nautical miles.

‡ Since the above was written, it is ascertained that this storm also passed over Galveston Bay, on the coast of Texas, where the hurricane blew with violence from the N. E., while at the mouth of the Mississippi, and along the northern shores of the gulf, the gale was not felt. Such facts appear quite sufficient to overthrow the hypothesis of Franklin relating to north-east storms, and are equally fatal to the more common theories. At Galveston, this storm, in passing over, veered by east to the south-east; the *rationale* of which may be made evident by drawing a line through the northern side of the figure on the chart, parallel to the track of the storm. A little further attention

more directly, and farther to the west, than is usual for storms which pass near the West India Islands, it having reached the shores of Mexico before commencing its sweep to the northward. Its course, so far as known, is N. 73° W. Its progress more than 2,200 miles in six days, which is nearly equal to 15½ miles per hour.

Track No. VI is that of the memorable gale of August, 1830, which, passing close by the Windward Islands, visited St. Thomas on the 12th; was near Turk's Island on the 13th; at the Bahamas on the 14th; on the gulf and coast of Florida on the 15th; along the coast of Georgia and the Carolinas on the 16th; off Virginia, Maryland, New Jersey, and New York on the 17th; off George's Bank and Cape Sable on the 18th; and over the Porpoise and Newfoundland Banks on the 19th of the same month: having occupied about seven days in its ascertained course from near the Windward Islands, a distance of more than 3000 miles—the rate of its progress being equal to 18 miles an hour.* If we suppose the actual velocity of the wind, in its rotary movement, to be five times greater than this rate of progress, which is not beyond the known velocity of such winds, it will be found equal, in this period, to a rectilinear course of 15,000 miles. The same remark applies, in substance, to all the storms which are passing under our review. What stronger evidence of the rotative action can be required than is afforded by this single consideration?

Route No. VII is that of an extensive gale, or hurricane, which swept over the western Atlantic in 1830, and which was encountered to the northward of the West India Islands on the 29th of September. It passed on a more eastern route than any which we have occasion to describe, to the vicinity of the Grand Bank of Newfoundland, where it was found on the 2d of October, having caused great damage and destruction on its widely extended track, to the many vessels which fell on its way. Its course is quite analagous to that which we have considered as having been probably pursued by the hurricane of October 3d, 1780. The ascertained route may be estimated at 1800 miles, and the average progress of the storm at 25 miles an hour.

Route No. VIII is that of a much smaller but extremely violent hurricane, which was encountered off Turk's Island on the 1st of September, 1821; to the northward of the Bahamas, and near the lat. of 30°, on the 2d; and on the coast of the Carolinas early in the morning of the 3d; and from thence, in the course of that day, along the sea coast to New York and Long Island; and which, on the night following, continued its course across the states of Connecticut, Massachusetts, New Hampshire, and Maine. We are not in possession of accounts by which its farther progress can be successfully traced.† The diameter of this storm appears not to have greatly exceeded 100 miles; its ascertained route and progress is about 1800 miles in 60 hours; equal to 30 miles an hour.

The last mentioned route may also be considered to be nearly the same as that of a similar, but less violent storm, which swept along the same portion of the coast of the United States on the 28th of April, 1835.

No. IX represents the route of a violent and extensive hurricane, which was encountered to the northward of Turk's Island, on the 22d of August, 1830; northward of the Bahamas on the 23d; and off the coast of the United States on the 24th, 25th, and 26th of the same month.

Much damage was done on the ocean by this storm; but it scarcely reached the American shores. Its duration off this coast was about 40 hours, and its progress appears to have been more tardy than that of some other storms.

No. X represents the track of a violent hurricane and snow-storm, which swept along the American coast, from the latitude of 30° N., on the 5th and 6th of December, 1830.

The last mentioned track also corresponds to that of another storm, of like character, which swept along the sea-coast on the 13th, 14th, and 15th of January, 1831. These violent winter storms exhibit nearly the same phases of wind and general characteristics, as those which appear in the summer and autumn.

Track No. XI represents a portion of the general route of the violent inland storm which swept over the lakes Erie and Ontario, on the 11th of November, 1835. This storm was very extensive, spreading from the sea-coast of Virginia into the Canadas, to a limit at present unknown. The anterior portion of this gale was but moderately felt, and its access was noted, chiefly, by the direction of the wind, and the great fall of the barometer; the violence of the storm being chiefly exhibited by the posterior and colder portion of the gale, as is common with extensive overland storms. The regular progression of this storm in an easterly direction is clearly established, by facts, collected by the writer, from the borders of Lake Michigan to the Gulf of St. Lawrence and the sea-coasts of New England and Nova Scotia.

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to the figure will also illustrate the general character of the *northers*, which are so common on the coast of Mexico during a considerable portion of the year.

* For a more extended notice of this storm, see American Journal of Science, vol. xx, pp. 34–38.

† The phenomena and progress of this storm have been more fully noticed in Silliman's Journal, vol. xx, pp. 24–27.

We have thus given a summary description of the route of twelve storms, or hurricanes, which have visited the American coasts and seas, at various periods, and at different seasons of the year. The lines on the chart, which represent the routes, are but approximations to the centre of the track, or course, of the several storms; and the gales are to be considered as extending their rotative circuit from 50 to 300 miles, or more, on each side of the delineations; the superficial extent of the storm being estimated both by actual information and by its duration at any point near the central portion of its route, as compared with its average rate of progress. The figure which appears upon the chart, on tracks No. I, V, and VII, will serve, in some degree, to illustrate the course of the wind in the various portions of the superficies covered by the storm, and, also, to explain the changes in the direction of the wind which occur successively at various points, during the regular progress of the gale. The dimensions of the several storms appear also to have gradually expanded during their course.

Storms of this character do not often act with great violence on any considerable extent of interior country to which they may arrive. Even upon the coasts on which they enter, such violence is not often experienced under the posterior limb of the gale which sweeps back from its circuit over the land, the usual woodlands and elevations being a sufficient protection. Often, indeed, the interior elevations afford such shelter as entirely to neutralize the effect of the wind at and near the surface, and the presence and passage of the hurricane is, in such cases, to be noted chiefly by the unusual depression, which the great whirling movement of the incumbent stratum of air produces in the mercury of the barometer, which thus indicates the presence or passage of the hurricane in positions where the force of the wind is not felt at all, or only with a moderate degree of violence. The action of these storms appears, indeed, to be at first confined to the stratum or current of air moving next the earth's surface, and they seldom, while in this position, appear to exceed a mile or so in altitude; and the course of the next highest or overlaying stratum does not, in these cases, seem to be at all affected by the action of the storm below. During the progress, however, by the influence of high land and other causes, the storms often become transferred, in whole or in part, to the next higher stratum of current. Thus we sometimes see a stratum of clouds moving with the full velocity of a violent storm, while the stratum of surface wind is nearly at rest, or moves with its ordinary velocity; and thus, also, it happens that balloons, ascending under such circumstances, are carried forward with a velocity of from 60 to 100 miles an hour. The foregoing remarks, are by no means hypothetical, but are the result of long continued observation and inquiry.

It will hardly escape notice, that the track of most of the hurricanes, as presented on the chart, appears to form part of an elliptical or parabolic circuit, and this will be more obvious if we make correction, in each case, for the slight distortion of the apparen-course in the higher latiudes, which is produced by the plane projection. We are also struck with the fact that the vertex of the curve is uniformly found on or near the 30th degree of latitude. In connection with this fact it may also be noted, that the latitude of 30° marks the external limit of the trade winds, on both sides of the equator; and perhaps it may not prove irrelevant to notice, even further, that by the parallel of 30° the surface area, as well as the atmosphere, of each hemisphere, is equally divided; the area between this latitude and the equator being about equal to that of the entire surface between the same latitude and the pole. It is not intended, however, to make these facts the basis of any theoretical inductions on the present occasion.

A variety of deductions may be drawn from the general facts which we have stated, some of which, though deeply interesting to the philosopher and votary of science, might be out of place in a nautical work of this description. For ourselves, we disclaim any bondage to existing theories in meteorology; and shall on the present occasion only proceed to notice a few of the more practical inferences which, to navigators and others may, perhaps, be of no doubtful utility.

1. A vessel bound to the eastward between the latitudes of 32° and 45° in the western part of the Atlantic, on being overtaken by a gale which commences blowing from any point to the eastward of S. E. or E. S. E., may avoid some portion of its violence, by putting her head to the northward, and when the gale has veered sufficiently in the same direction, may safely resume her course. But by standing to the southward under like circumstances, she will probably fall into the heart of the storm.

2. In the same region, vessels, on taking a gale from S. E., or points near thereto, will probably soon find themselves in the heart of the storm, and after its first fury is spent, may expect its recurrence from the opposite quarter. The most promising mode of mitigating its violence, and at the same time shortening its duration, is to stand to the southward upon the wind, as long as may be necessary or possible; and if the movement succeeds, the wind will gradually head you off in the same direction. If it becomes necessary to heave to, and the wind does not veer, be prepared for a blast from the north-west.

3. In the same latitudes a vessel scudding in a gale, with the wind at east or north-

east, shortens its duration. On the contrary, a vessel scudding before a south-westerly or westerly gale, will thereby increase its duration.

4. A vessel which is pursuing her course to the westward or south-westward, in this part of the Atlantic, meets the storms in their course, and thereby shortens the periods of their occurrence; and will encounter more gales in an equal number of days, than if stationary, or sailing in a different direction.

5. On the other hand, vessels while sailing to the eastward or north-eastward, or in the course of the storms, will lengthen the periods between their occurrence, and consequently experience them less frequently than vessels sailing on a different course. The difference of exposure which results from these opposite courses, on the American coast, may in most cases be estimated as nearly two to one.

6. The hazard from casualties, and of consequence the value of insurance, is enhanced or diminished by the direction of the passage, as shown under the two last heads.

7. As the ordinary routine of the winds and weather in these latitudes, often corresponds to the phases which are exhibited by the storms as before described, a correct opinion, founded upon this resemblance, can often be formed of the approaching changes of wind and weather, which may be highly useful to the observing navigator.

8. It will be perceived, from the foregoing facts, that the occurrence of a storm at a particular locality, has no immediate connection with astronomical periods, such as the changes of the moon, or the time of the equinoxes.

9. A due consideration of the facts which have been stated, particularly those under our twelfth head, will inspire additional confidence in the indications of the *barometer*, and these ought not to be neglected, even should the fall of the mercury be unattended by any appearances of violence in the weather, as the other side of the gale will be pretty sure to take effect, and often in a manner so sudden and violent as to more than compensate for its previous forbearance. Not the least reliance, however, should be placed upon the prognostics, which are usually attached to the scale of the barometer, such as Set-Fair, Fair, Change, Rain, &c., as in this region at least, they serve no other purpose than to bring this valuable instrument into discredit. It is the mere rising and falling of the mercury, which chiefly deserves attention, and not its conformity to a particular point in the scale of elevation.

10. These practical inferences apply in terms, chiefly to storms which have passed to the northward of the 30th degree of latitude on the American coast, but with the necessary modification as to the point of the compass, which results from the westerly course pursued by the storm while in the lower latitudes, are, for the most part, equally applicable to the storms and hurricanes which occur in the West Indies, and south of the parallel of 30°. As the marked occurrence of tempestuous weather is here less frequent, it may be sufficient to notice that the direction of the winds of the West Indian seas, is from 8 to 11 points of the compass *more to the left* than on the coast of the United States in the latitude of New York.

Vicissitudes of winds and weather on this coast which do not conform to the foregoing specifications, are more frequent in April, May, and June, than in other months. At this season it is not uncommon to find a regular current of easterly wind prevailing for many days, producing sometimes heavy rains, and always an elevated state of the barometer. Easterly or southerly winds under which the barometer rises, or maintains its elevation, are not of a gyratory or stormy character; but such winds frequently terminate in the falling of the barometer and the usual phenomena of an easterly storm.

The typhoons and storms of the China sea and eastern coast of Asia, appear to be similar in character to the hurricanes of the West Indies and the storms of this coast, when prevailing in the same latitudes. There is reason to believe that the great circuits of wind, of which the trade winds form an integral part, are nearly uniform in all the great oceanic basins; and that the *course* of these circuits and of the stormy gyrations which they may contain, is, in the southern hemisphere, in a *counter direction* to those north of the equator, producing a corresponding difference in the general phases of storms and winds in the two hemispheres.

From the foregoing results we infer the value and importance of correct marine reports relating to violent gales. Those reports should always comprise the *date*, the *latitude and longitude*, and the *principal direction and changes of the wind*.

ERRATA.

LATITUDES AND LONGITUDES.

Page 675, *Nova Scotia*—Cape Chignecto,.....for long. 65 48, read long. 64 48
" " " Haute Isle,.....for long. 65 41, read long. 64 51
" " *Prince Edward I.*—Richmond Bay,.....for lat. 47 37, read lat. 46 47
" " *Newfoundland*—Pt. Breem.....for lat. 46 49, read lat. 46 59
" " " Cape St. Mary,.....for long. 54 56, read long. 54 13
" 676, *Maine*—Cashe's Ledge, shoalest part, ...for long. 70 06, read long. 69 06
" " Seaconnet Point, last line under *Massachusetts*, should be placed after *Rhode Island.*
" 678 a 680, *Galveztown entrance*,.....for lat. 29 15, read lat. 29 19
" 680, *Sisal Fort*, ...for lat. 21 21, read lat. 21 10
" " " " .....for long. 90 10, read long. 90 02

[*This Table contains the* LATITUDES *and* LONGITUDES *of the most remarkable Harbors, Islands, Shoals, Capes, &c., in this work, founded on the latest and most accurate Astronomical Observations, Surveys, and Charts.*]

The Longitudes are reckoned from the Meridian of Greenwich.

RIVER ST. CROIX TO CAPE CANSO.

Nova Scotia.	Lat. D.	Lat. M.	Long. D.	Long. M.
Ent. of St. Croix R.	45	00 N	67	02 W
Macgoine Island, entrance St. John's River	45	12.5	66	05
Cape Spencer	45	12	65	55
Cape Chignecto	45	18	65	48
Haute Isle	45	15	65	51
Annapolis Gut	44	43	65	44
Bryer's Island light	44	16	66	22
Cape Fourchu light	43	49.5	66	07
Seal Island light	43	24	65	58.5
Cape Sable	43	24	65	36
Shelburne light	43	38.5	65	15.5
Coffins Island light	44	03	64	36
Cross Island lights	44	20	64	07
Sambro light	44	26.5	63	33
HALIFAX	44	38.3	63	35
Sheet Harbor ent.	44	52	62	29
Sherbroke	45	08.5	62	00
White Head Island	45	11.7	61	10
Cape Canso, Cranberry Island light	45	19.5	60	57.5
SABLE I., E. end	43	59	59	47.5
do W. end	43	57	60	13.6

GULF OF ST. LAWRENCE.

Cape Breton.	Lat. D.	Lat. M.	Long. D.	Long. M.
Gut of Canso, S. ent.	45	30 N	61	14 W
Cape Hinchinbroke	45	34	60	42
Cape Portland	45	49	60	05
Louisburgh	45	53.5	60	00
Cape Breton	45	57	59	48.5
Scatari I., N. E. pt.	46	02	59	42
Flint Island	46	11.5	59	47
SIDNEY light	46	18	60	09
Cape Egmont	46	53	60	22
Cape North	47	02	60	27
Island St. Paul, N. extreme	47	14	60	11.3
Chetican Harbor, ent.	46	40	61	00
Seal Island	46	23	61	15
Cape Mabon	46	12	61	26
Just au Corps I.	46	00	61	37.5
Gut of Canso, N. ent.	45	42	61	28
Cape St. George	45	53	61	56
Pictou I., E. end	45	49	62	33
do light	45	41.5	62	40
Cape Tormentin	46	05	63	50
Richibucto Harbor, entrance	46	43	64	50
Cape Esquiminac	47	04	64	51
Prince Edward I.				
Prince Edward I., N. cape	47	03	64	04
do. W. point	46	41	64	23
Red Head	46	26	64	08
St. Peter's Island	46	07	63	14
Hillsborough Bay, ent.	46	07	63	10
Bear Cape	46	00	62	29
East Cape	46	28	62	00
Richmond Bay	47	37	63	44
Pt. Miscou, ent. Chaleur Bay	48	01	64	35
Cape Despair	48	25.5	64	21.5
Cape Gaspé	48	45.2	64	12.4
Cape Rozier	48	51.7	64	14.8
Mt. St. Louis River	49	14.6	65	46.6
Cape Chatte	49	06	66	48.3
Anticosti Island.				
I. of Anticosti, E. pt.	49	08.4	61	43
do Observation Bay.	49	39	62	44.4
do N. pt.	49	57.7	64	12
do W. pt.	49	52.3	64	35.1
do Ellis' Bay ent.	49	47	64	25
do S. W. pt.	49	23.9	63	38.8
do S. pt.	49	03.7	62	18.5
Magdalen Islands.				
Magdalen Is., N. Bird Rock	47	51	61	12.2
Bryon I., E. pt	47	48	61	27.5
East Point	47	37.6	61	26
Entry Island	47	17	61	45
Amherst I., S. W. pt.	47	13	62	04
Deadman's I.	47	16.1	62	15.3

NEWFOUNDLAND.

Newfoundland.	Lat. D.	Lat. M.	Long. D.	Long. M.
Cape Norman	51	38.1	55	56.3
Green Island	51	24.3	56	36.8
Ferrol Point	51	02.4	57	05.6
Rich Point	50	41.8	57	27.2
Port Saunders	50	38.6	57	21
Bay St. Pauls, ent.	49	50	57	51
Bon Bay	49	33	58	00
Cape St. Gregory	49	22	58	16
Red Island	48	34	59	16.3
Cod-Roy Island	47	52.6	59	26.8
CAPE RAY	47	36.9	59	20.2
Connoise Bay	47	40	58	00
Burgeo Islands	47	33	57	43
Penguin Island	47	22.5	57	01
St. Pierre	46	46.8	56	09.7
Pt. May	46	54	56	00
C. Chapeau Rouge	46	53	55	22
Pt. Breem	46	49	54	16
Cape St. Mary	46	50	54	58
Cape Pine	46	38	53	35
CAPE RACE	46	39.4	53	04.6
Cape Race (Virgin) Rocks	46	26	50	55
Cape Ballard	46	47	52	59
Cape Broyle Harbor	47	05.5	52	52
Bay of Bulls	47	18	52	47
Cape Spear	47	30.5	52	39
ST. JOHNS	47	34.5	52	43.4
C. St. Francis	47	48	52	49
Breakheart Point	48	09	52	57
Trinity Harbor	48	22	53	22
Cape Bonavista	48	42	53	05
Cape Freels	49	18	53	30
Funk Island	49	45	53	12
Snap Rock	49	55	53	44
Cape Fogo	49	41	54	00
Cape St. John, N. Bill	50	00	55	31
Horse Island, E. pt.	50	13	55	43
Belle Isle, N. E. pt.	50	49	55	29
Groais Island, N. pt.	50	58	55	35

	Lat.		Long.	
	D.	M. N	D.	M. W
Oroc Harbor	51	03.3	55	49.6
Haro Bay entrance	51	16	55	41
Cape St. Anthony	51	23	55	31
Cape Bald,	51	39.7	55	27.4
Belle Isle, N. E. point	52	01.3	55	19.1
do S. point	51	53	55	25
Grand Bank, Newfoundland				
do Southern edge	42	56	50	00
Cape Race (Virgin) Rocks	46	26	50	55

QUEBEC TO BELLE ISLE.

Canada.	Lat.		Long.	
	D.	M. N	D.	M. W
QUEBEC, N. bastion,	46	49.1	71	16
Coudres I., W. pt. Prairie Bay	47	24.6	70	28
Green Island light	48	03.4	69	28.2
Port Neuf	48	37.4	69	09
Bic Island	48	25	68	52
Bersimis Point	48	54.1	68	41.6
Maniconagon Point	49	06.2	68	15
Cape St. Nicholas	49	15.9	67	53.2
Labrador.				
Point des Monts	49	19.7	67	25
Egg Island	49	38.3	67	13.2
Lobster Bay	49	49.5	67	06
St. Margaret's Point	50	02.5	66	47.7
Point Moisic	50	11.4	66	07.7
Manitoni Point	50	17.7	65	17.1
Mingan Island	50	12.9	64	10.5
Clearwater Point	50	12.6	63	30.1
Appeetetat Bay	50	16.7	63	01.1
Nabesippi River, ent	50	14	62	15.8
Natashquan River	50	07	61	50.7
Kegashka Bay	50	11.5	61	18.3
Cape Whittle	50	10.7	60	09.8
Hare Harbor	50	36.5	59	20.1
Grand Mecattina Point	50	44.2	59	02.9
Mistanoque Island	51	15.8	58	15.1
Lion Island	51	24.1	57	41.3
Greenly Island	51	23.3	57	13.6
Forteau Point	51	25.6	56	59.4
Loup Bay	51	31.6	56	51.8
Red Bay Harbor Island	51	44	56	28.4
York Point	51	58	55	55.9
Battle Islands, S. E. island	52	15.7	55	13.3
Cape St. Lewis	52	21.4	55	41.4
BELLE ISLE, N. E. point	52	01.3	55	19.1
do S. point	51	53	55	25

COAST OF THE UNITED STATES OF AMERICA.

Maine.	Lat.		Long.	
	D.	M.	D.	M.
Entrance of St. Croix River	45	00 N	67	02 W
Campo Bello Island, N. pt	44	57	66	55
Wolf Islands, northernmost	44	57.5	66	43
Quoddy Head, lighthouse	44	47.5	66	58
Grand Manan, N. E. head	44	45	66	45
do S. W. head	44	34	66	53
Libby I. lightho., entrance of Machias Bay	44	32.5	67	22
Machias Seal Is., 2 lights	44	29	67	05.5
Petit Manan light	44	21	67	49
Baker's Island light	44	13.5	68	08
Mount Desert Rock light	43	50	68	06.5
Isle au Haut	43	59	68	34
Castine	44	22.5	68	45
Matinicus Island light	43	46.5	68	4[illegible]
Manheigin Island light	43	44 N	69	15 W
Penmaquid Point light	43	48	69	29
Bantum Ledge	43	42	69	35
Seguin Island light	43	41.6	69	44
Brunswick	43	52.5	69	56
Cape Small Point	43	40.5	69	48.8
Cashes Ledge, shoalest part	43	02	70	06
PORTLAND, lighthouse	43	36	70	12.2
do City hall	43	39.2	70	15.2
Cape Elizabeth	43	33.6	70	11.6
Agamenticus Hills	43	13	70	41
Cape Porpoise	43	21	70	25
Bald Head	43	13	70	34.5
Cape Neddock Nubble	43	10	70	35
Boon Island light	43	08	70	29
New Hampshire.				
PORTSMOUTH, light	43	03.5	70	43
Is. of Shoals, White I. light	42	58	70	37.3
PORTSMOUTH	43	04.5	70	45
Great Boar's Head	42	56	70	48
Massachusetts.				
Newburyport, lights on Plum I.	42	48	70	49.5
Ipswich, lights	42	41.1	70	46.5
Squam light	42	39.8	70	41.1
Straitsmouth Harbor light	42	39.7	70	35.6
CAPE ANN, Thatcher's I. lights	42	38.3	70	34.7
do Eastern point light	42	34.8	70	40.2
Marblehead light	42	30.3	70	50.5
Baker's Island, lights	42	32.2	70	47.5
SALEM, city hall	42	31.5	70	53.9
BOSTON, lighthouse	42	19.8	70	53.5
do State house	42	21.5	71	04
Scituate light	42	12.3	70	43.2
Plymouth lights	42	00.1	70	36.8
Billingsgate light	41	51.6	70	04.5
Race Point light	42	03.7	70	14.8
CAPE COD light	42	02.4	70	04.3
Long Point light	42	02.1	70	10.6
Chatham Harbor, lights	41	40.3	69	57.2
Nauset lights	41	51.6	69	57.3
Monomoy Point light	41	33.6	70	00
Shoals of George's Bank				
Great Shoal, S. E. point	41	34	67	43
do W. pt	41	42	67	59
do N. E. pt	41	48	67	47
do N. shoal	41	53	67	43
do Third shoal	41	51	67	26
do E. shoal	41	47	67	19
Nantucket, Sandy Point light	41	23.4	70	03
do Brant Point light	41	17.4	70	05.9
do Sancoty Head	41	17	69	59
Nantucket South Shoal	41	04	69	55
Cape Pogee light (Vineyard)	41	25.1	70	27
Holmes' Hole, W. Chop light	41	29	70	36.7
Nobsque Point light	41	31.1	70	39.9
Tarpaulin Cove light	41	26.2	70	46.1
Cutterhunk light	41	24.6	70	57.4
Gay Head light	41	21	70	50.7
No Man's Land	41	14	70	49
New Bedford, Mariners' Ch.	41	38.1	70	55.5
Clark's Point light	41	35.5	70	54.2
Dumpling Rock light	41	32.2	70	55.6
Gooseberry Neck	41	28.6	71	02.4
Seaconnet Point	41	26.5	71	13.5
Rhode Island.				
NEWPORT, Court house	41	29.5	71	19.2
Beaver Tail light	41	26.8	71	24.4
Goat Island light	41	29.3	71	20.1

	Lat. D.	Lat. M. N	Long. D.	Long. M. W
Dutch Island light	41	29.8	71	24.8
Warwick Neck light	41	34.2	71	27
Nayat Point light	41	43.5	71	20.8
Providence Col.	41	49.6	71	24.8
Point Judith light	41	21.6	71	29.3
Block Island, lights	41	13.4	71	35
do S. E. point	41	08	71	34
Watch Hill light	41	18.2	71	52
Little Gull Island light	41	12.3	72	06.8
New York and Connecticut.				
Montauk Point light, (E. end Long Island)	41	04.2	71	51.9
Cedar I. light, (Sag Harbor)	41	02.3	72	16.1
New London light	41	18.9	72	05.8
Plum Island light	41	10.3	72	13.2
Saybrook Point light	41	16.2	72	21
Faulkner's Island light	41	12.6	72	39.7
New Haven, Yale College	41	18.5	72	56.5
do light	41	14.9	72	54.7
Stratford Point light	41	09	73	06.6
Black Rock light	41	08.4	73	13.5
Norwalk Island	41	02.8	73	25.6
Old Field light	40	58.5	73	07.5
Eaton's Neck light	40	57.1	73	24.2
New York, City hall,	40	42.7	74	01
Sandy Hook light	40	27.6	74	00.8
N. Jersey and Pennsylvania.				
Neversink, lights	40	23.7	73	59.8
Barnegat light	39	46.5	74	07.5
Great Egg Harbor entrance	39	19	74	35
Cape May light	38	55.8	74	58.5
Cape Henlopen light	38	47.0	75	05.5
Egg Island light	39	10.4	75	09
Philadelphia, Independ. hall	39	57	75	09.9
Maryland and Virginia.				
Smith's Island light	37	13	75	52
Cape Charles	37	03	76	02
Cape Henry light	36	56	76	04
Norfolk	36	51	76	19
Old Point Comfort	37	00	76	22.2
Yorktown	37	13	76	34
Petersburg	37	14	77	25
Richmond	37	32	77	27
Washington City, Capitol	38	53.4	77	03
Baltimore	39	17	76	39
Annapolis, Md.	38	59	76	33
North Carolina.				
Currituck Inlet	36	23	75	55
Cape Hatteras	35	14	75	30
Deep soundings off do	35	06		
Ocracoke Inlet	35	05.5	75	59
Cape Lookout	34	37	76	33
Deep soundings off do	34	28		
Old Topsail Inlet	34	41	76	40
Beaufort	34	43	76	40
Wilmington	34	14	77	58
Brunswick	34	02	77	58
Smithville	33	54	78	01
New Inlet entrance	33	56	77	55
Cape Fear	33	48	77	57
Deep soundings off do	33	35		
South Carolina.				
Georgetown	33	22	79	17
Georgetown lighthouse	33	12.5	79	10
Cape Roman	33	01	79	24
Charleston, Fort Pinckney	32	46	79	55.1
Charleston lighthouse	32	42	79	54.2
North Eddisto Inlet	32	32	80	10
Beaufort, (S. C.)	32	25.5	80	40
Port Royal entrance, (Bar)	32	09	80	36
Georgia.				
Tybee light	32	00	80	52
Savannah	32	05	81	08.3
St. Catherine's Sound, (Bar)	31	41	81	11
Sapello Bar	31	32	81	15
Doboy Bar	31	20	81	22
Light on St. Simon's Island, South point	31	08	81	36
Brunswick	31	08	81	42
St. Andrew's Sound	31	00	81	39
S. point Cumberland Island,	30	45	81	37
Amelia Island, S. pt.	30	30	81	35
East Coast of Florida.				
River St. John's, (General's Mount)	30	20.5	81	33
St. Augustine, lighthouse	29	52.2	81	25
Cape Canaveral	28	27	80	33
Outer breakers off do	28	28	80	28
Tortulas or Hummocks	27	35	80	30
Hillsborough Island, North pt.	27	32	80	18
Hillsborough Island, South pt.	27	14	80	11
Mount Pelado or Bald Head	27	01	80	11
Greenville's Inlet	26	47	80	02
Cooper's Hill	26	42	80	03
Sand Hills	26	32	80	03
New Inlet	26	18	80	00
Middle River entrance	26	08	80	00
South Coast of Florida.				
Cape Florida, light	25	41	80	05.5
Cayo Largo, N. E. point	25	18	80	16.5
Key Tavernier	24	59	80	31.5
Old Matecumbe, S. W. point	24	51	80	44
Key Sombrero	24	38	81	07
Looe Key	24	33.5	81	24
Samboes Keys (centre)	24	27.5	81	40
Key West, S. W. point	24	32	81	47.5
Sand Key, Cayo Arena	24	26	81	53
Tortugas Islands and Banks, N. E. part	24	41	82	47
——— N. W. part	24	40	82	53
——— S. E. part	24	33.5	82	53.2
——— S. W. part	24	31	83	07
Bush Key light	24	36	82	53
West Coast of Florida.				
Key Vacas	24	42	81	05
Key Axi	24	57	81	07
Cape Sable	25	04	81	06
Cape Roman	26	00	81	43
Entrance Bay Carlos	26	57	82	18
Tampa Bay, entrance	27	36	82	48
Anclote Keys	28	25	82	54
St. Mark's, lighthouse	30	04	84	20
Dog Island light	29	43.5	84	41
Cape St. George	29	35	85	04
Cape St. Blas	29	39	85	21
St. Joseph's Bay, entrance	29	51.6	85	26
St. Andrew's Island, N. W. point	30	03	85	37.7
St. Rosa's Bay, entrance	30	27	86	31
Pensacola, Town	30	24	87	10.2
Pensacola, Light	30	19	87	16.9
Mobile Point, light	30	13.7	87	.58

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	Lat. D.	Lat. M. N	Long. D.	Long. M. W
Mobile Bar	30	10	87	58
MOBILE	30	41.8	87	59
Massacre Island, W. point	30	12.0	88	22
Ship Island, S. W. point	30	12.6	88	54
Chandelier Islands, N. point	30	01	88	44
——— S. point Falos Island	29	40	88	50
Louisiana.				
Key Breton, N. E. point	29	29	89	07
MISSISSIPPI River—				
——— Pass à l'outre	29	14	89	00
——— N. E. Pass, Light	29	08.5	89	01.4
——— S. E. Pass	29	06	88	57
——— S. Pass	28	59.7	89	07.4
——— S. W Pass, pilot stat'n	28	58.5	89	20
NEW ORLEANS	29	57½	90	02
Barrataria	29	17½	90	10
Bayou La Fourche	29	06	90	26
Timbalier Island, (Tonbalier,) N. W. point	29	04	90	58
Dernière Isle, W. point	28	59	91	10
Bayou Descartes, entrance	29	12½	91	22
Point au Fer	29	19½	91	33
Rabbit Island	29	29	91	49
Sabine River, entrance	29	40.6	93	49
Galveztown entrance	29	15	94	49

ISLANDS IN THE WEST INDIES.

Windward Islands.	Lat. D.	Lat. M. N	Long D.	Long M. W
TRINIDAD—				
Port Spain, (Fort St. David,)	10	39	61	31.9
——— Icaque Point	10	04	61	57
——— Point Galote	10	10	61	00
——— Point Galera	10	50	60	56
Tobago, N. E. point	11	20.1	60	27
Grenada, (Fort)	12	02.9	61	48.9
Barbadoes, (Engineers' Wh'f.)	13	04	59	37.7
St. Vincent's, Kingston	13	12	61	16
St. Lucia	14	06	61	01
——— S. point	13	41	61	00
Martinico, Diamond Rock	14	26.6	61	02.7
——— Port Royal	14	35.9	61	04.2
Dominica, Roseau	15	18.3	61	25
The Saint's Island, W. point	15	50.8	61	38.4
Mariegalante, S. point	15	52	61	17
Guadaloupe, Basse Terre	15	59.5	61	44.3
——— N. W. point	16	20	61	50.7
Antigua, Fort James	17	08	61	52.5
Virgin Islands.				
Montserrat, N. E. point	16	47.6	62	12
Redondo Island	16	56	62	25
Nevis, Charleston	17	08.7	62	37.9
St. Christopher's, or Basse Terre	17	17.7	62	42.2
St. Eustatia, Road	17	29	63	00
Saba, centre	17	41.2	63	13.5
Aves or Bird's Island	15	40.5	63	38.5
Barbuda, N. point	17	47	62	02
St. Bartholomew, S. point	17	53.5	62	56.9
St. Martin's, Marigot Fort	18	05.3	63	03
Anguilla, S. W. point	18	10	63	13
Anguilleta, N. E. point	18	18	62	58
Prickly Pear	18	20	63	23
Sombrero	18	38.0	63	27.4
St Croix, Town	17	44.5	64	40.7
Anegada, S. point of shoal	18	32	64	13
——— W. pt	18	44	64	20
Virgin Gorda, E. P	18	30	64	21
St. John's, S. point	18	18	64	44
St. Thomas, Fort Christian	18	21.1	64	55.3

Porto Rico.	Lat. D.	Lat. M.	Long. D.	Long. M.
Cape St. John, or N. E	18	24 N	65	39 W
PORTO RICO, St. Augustine's Battery, western turret	18	29	66	07.1
Point Bruquen, or N. W	18	31	67	08
Point St. Francisco	18	21	67	15
Cape Roxo, or S. W. point	17	57	67	08
Caxa de Los Muertos	17	50	66	33
Point Coamo	17	55	66	30
C. Mala Pasqua, or S. E. pt	17	59	65	52
MONA ISLAND, E. point	18	07	67	47
Monito Island,	18	11	67	52
Zacheo or Dessecho Island	18	24	67	27
St. Domingo or Hispaniola.				
Cape Engaño	18	35	68	20
Saona Island, E. part	18	12	68	30
St. Catherine's Island	18	18	69	00
St. Domingo	18	29	69	52
La Catalina	18	08	70	11
Altavela, Rock	17	28.2	71	39.5
Cape Jaquemel	18	10	72	33
Island Vaca (à Vache) E. end	18	04	73	34
Point Gravois	18	01	73	53
Cape Tiberon	18	20	74	28
Navaza Island	18	24	75	00
Cape Donna Maria	18	37	74	23
Jeremie	18	37	74	03
Caymito	18	39	73	43
Petit Guave	18	24	72	50
Leogano	18	30	72	33
PORT AU PRINCE	18	33	72	21
I. Gonave, S. E. P	18	40	72	45
——— N. W. P	18	58	73	13
Point St. Mark	19	02	72	47
St. Nicola, Mole	19	52	73	22.1
Tortugas, E. point	20	02	72	31
Cape Hayti City, watering tur't	19	46.4	72	11.2
CAPE FRANÇOIS	19	40	69	53
Shoal off Monte Christe	20	02	71	42
Monte Christe	19	54	71	34
Grange Point	19	54	71	36
Point Isabella	19	57	71	01
Cape Samana, Banistre Bay, S. side	19	10.2	69	15.4
Cape Raphael	19	04	68	52
Jamaica.				
Morant, E. point	17	56	76	11.2
PORT ROYAL, Fort Charles	17	56.1	76	50.5
Portland Point	17	43.5	77	11
Pedro Bluffs	17	52.5	77	45
Savannah-la-Mar, Fort	18	12.3	78	08.5
Cape Negril, S. point	18	15	78	24
——— Montego Bay	18	29	77	56
Falmouth	18	28	77	41.5
St. Ann's	18	27	77	15
Port Maria	18	22	76	54
Annetta Bay	18	16	76	45
N. E. point	18	09	76	20.5
Morant Keys, or Las Panas	17	25	75	59
PEDRO SHOALS—				
Portland R., N. E. P	17	07.5	77	28
South Key	16	57	77	53
Rock five feet above water	16	48	78	15
N. Pt. Pedro Shoal	17	36	78	54
Formigas Shoal, N. E. P	18	35	75	50
——— S. W. P	18	27	76	00
Little Cayman, S. W. P	19	36	80	14
——— Caymanbrack, E. P	19	44	79	45

	Lat. D. M.	Long. D. M.
Grand Cayman, Fort George, W. end	19 14 N	81 24 W
——— E. P.	19 20	81 10
Swan Islands, E. P.	17 25	83 51
New Shoal, (Sandy Key)	15 52	78 33
South Side of Cuba.		
Cape Maize	20 15	74 07
Entrance Cumberland Harbor	19 54	75 26
St. Jago de Cuba, entrance	19 58	76 08
Tarquin's Peak	20 03	76 51
Cape Cruz	19 47	77 45
Manzanilla	20 33	77 20
Key Breton	21 05	79 43
Trinidad River	21 43	80 13
Bay Xagua	22 02	80 42
Stone Keys	21 57	81 15
Los Jardinillos, S. E. point of the Bank	21 35	81 15
Canal del Rosario	21 33	82 03
I. Pines, E. P.	21 32	82 31
——— S. W. P.	21 25	83 07
Point Piedras	22 00	83 55
Cape Corrientes	21 45	84 32
Cape St. Antonio	21 52	84 59
North Side of Cuba.		
Sancho Pedro Shoal	22 01	85 02
Los Colorados, S. W. P.	22 09	84 48
——— N. E. P.	22 44	84 08
Bahia Honda, entrance	23 01	83 13
Port Cabanas	23 02.5	82 59.2
Mariel	23 03	82 47
Havana, (the Moro)	23 09.4	82 22
Point Escondido	23 08	81 51
Point Guanos	23 08	81 44
Pan of Matanzas	23 02	81 46
Matanzas	23 03	81 40.2
Point Ycacos	23 13	81 10.2
Key Cruz del Padre, N. point	23 18	80 53.7
Las Cabezas, centre N. point	23 16	80 36
Nicola's Shoal	23 14	80 19.3
Key Verde	23 09	80 14
Point Maternillos	21 41	77 08
Nuevitas	21 36	77 06
Point de Mulas, entrance	21 05	75 31
Tanamo	20 44.5	75 12.2
Key Moa	20 43	74 47
Point Guarico	20 39	74 41
Baracoa, Town	20 21	74 24
Caycos I.		
N. Point Bajo Navidad	20 12	68 46
Silver Key Bank, S. E. end	20 14	69 32
——— N. E. do.	20 35	69 17
——— N. do.	20 12	69 52
Square Handkerchief, N. E. P.	21 07	70 26
——— S. E. P.	20 49	70 23
——— S. W. P.	20 55	70 56
Turks Island, N. P., Grand Turk	21 32	71 04
Turks Island, Salt Key	21 20	71 08
——— Sand Key	21 11.5	71 10.5
——— Endymion Rocks	21 07	71 15
Great Caycos I., S. pt., Swimmer Shoal	21 05	71 27
——— N. E. pt. or Shoal St. Philip	21 42.5	71 20
——— N. W. part	21 53	72 17
North Caycos, middle	21 56	71 57
Booby Rocks, off do.	21 58	71 58
Providence Caycos, N. W. pt.	21 50 N	72 20 W
West Caycos, S. W. pt.	21 37.5	72 27
South Point Shoal	21 02.5	71 42
Passage Islands.		
Great Inagua or Heneagua, N. E. P.	21 20	73 00
——— Statira Shoal, S. E. P.	20 55	73 08
——— S. W. P.	20 55	73 38
——— N. W. P.	21 09	73 40
Little Heneagua, E. P.	21 29	72 55
——— W. P.	21 29	73 06
Hogsties or Corrolaes	21 40	73 48
Lookout or Cuidado Bank	21 57	72 55
Mayuguana, E. Reef	22 20	72 40
——— N. do.	22 32	73 09
——— S. W. point	22 22	73 11
E. point French Keys, or I. Planas	22 41	73 27
Miraporvos, S. Key	22 05	74 31
Castle Island, or S. Key	22 07	74 20
Fortune Island, S. P.	22 32	74 23
North Key, Bird Island	22 49.5	74 24
Great Bahama Bank.		
Crooked Island, W. P.	22 48.5	74 23
Acklin's Island, N. E. P.	22 44	73 51
Atwood's Keys, or I. Samana, E. P.	23 05	73 37
——— W. P.	23 04	73 48
Rum Key, E. P.	23 41	74 46
Watling's Island, N. E. P.	24 08	74 25
——— S. W. P.	23 55	74 32
Conception or Little Island	23 50	75 05
St. Salvador, or Guanahari, S. E. P.	24 09	75 18
——— N. P.	24 42	75 43
Eleuthera, or Hetera Island, S. P.	24 37	76 08
——— N. P.	25 34	76 43
Nassau, New Providence, light	25 05.2	77 21.2
Andros Islands, S. P.	23 44	77 38
——— N. E. P.	25 10	78 02
Berry Islands, S. E. Whale Key	25 25	77 44
Great Stirrups Key, centre	25 49	77 53
Blackwood's Bush	25 27	78 03
Little Isaac, Eastern	25 56.5	78 50
Great Isaac	26 03	79 03
Benimi Island, Southern	25 42	79 19
Gun Key light	25 34.6	79 18.4
South Riding Rocks	25 14.5	79 09
Orange Keys, North	24 57	79 08
——— South	24 54	79 08.5
Ginger Key	22 46	78 08
Key Lobos, Beacon 20 feet	22 22.5	77 33
Las Mucaras, Diamond Point,	22 11	77 14
Key San Domingo	21 42	75 45
Key Verde Island	22 02.5	75 10
Key Sal, Ragged Island	22 12	75 42
Yuma, or Long I., S. P.	22 50	74 50
——— N. P.	23 45	75 18
Exuma, N. W. P.	23 42	76 00
Little Bahama Banks.		
The Hole in the Wall	25 51	77 09
Light on do.	25 51.5	77 10.6
E. point of Abaco	26 18	76 57
Elbow Reef	26 34	76 52
Man of War Key	26 37.5	76 57.5
Great Guana Key	26 42	76 04

	Lat. D. M.	Long. D. M.
Little Bahama Bank, N. P.	27 35 N	79 11 W
Memory Rock	26 55	79 02
Sand Key	26 49	79 01.5
Wood Key	26 45	79 02
Great Bahama, W. P.	26 42	79 01
——— E. P.	26 40	77 48
Salt Key Bank.		
Dog Keys, N. W. P.	24 04	79 50
Water Key	23 59	80 17
Do'ble-Headed Shot Key, light	23 56.4	80 27.6
Salt Key	23 42	80 20
Anguilla, E. P. small island	23 29	79 26
Bermuda.		
GEORGETOWN	32 22.2	64 37.6
Wreck Hill, westernmost land	32 18.5	64 50

EAST COAST OF AMERICA, FROM GULF OF MEXICO TO CAPE HORN.

Texas.	Lat. D. M.	Long. D. M.
Galveston Inlet	29 15 N	94 49 W
W. P. Galveston Island	29 09	95 08
Rio Brazos	29 03	95 22
Pasa del Caballo	28 19.3	96 22.3
Aranzas Inlet	27 49	97 04
Corpus Christi	27 36.5	97 16
Brazo de Santiago	26 06	97 26
Rio Bravo del Norte	25 56	97 26
River St. Fernando, entrance,	25 22	97 32
Inlets to Laguna Madre	25 02	97 41
Bar de la Marine, entrance River St. Ander	23 45	97 58
Bar del Tordo	22 52	97 57
Mount Commandante	22 48	97 58
East Coast of Mexico.		
Bar de la Trinidad	22 39	97 57
Bar Ciega	22 34	97 58
River Tampico	22 16	98 02
Point de Xeres	21 55	97 45
Cape Rojo	21 45	97 35
Tamiagua City	21 16	97 45
River Tuspan, entrance	21 01	97 30
Point Piedras	20 50	97 21
River Cazones	20 44	97 15
Tenestequepe	20 40	97 12
Boca da Lima	20 37	97 07
River Toculata, entrance	20 30	97 01
Mount Gordo	20 22	96 57
River Nauta, entrance	20 16	96 50
River Palina, entrance	20 10	96 45
Point Piedras	20 00	96 35
River de Santa Nos	19 55	96 30
Point Delgada	19 52	96 26
Point M. Andrea	19 43	96 21
Point de Bernat	19 40	96 21
River St. John Angel	19 32	96 20
Xalapa	19 32	96 50
Peak de Orizaba	19 02	97 09
Point de Zampola	19 30	96 16
River St. Carlos	19 26	96 15
River Antigua	19 20	96 14
Point Gorda	19 15	96 04
VERA CRUZ	19 12	96 04½
St. John de Ulloa	19 12½	96 04
Xamapa	19 04	96 06
River Medelin, entrance	19 06	95 59
Point Anton Lizardo	19 04	95 45
Bar de Alvarado	18 46	95 38
Tlacotalpan	18 35	95 29

South Coast of the Gulf of Mexico.	Lat. D. M.	Long. D. M.
Vigia	18 38 N	95 18 W
Point Roca Partida	18 43	94 59
Point Morillos	18 40	94 54
Pic de San Martin	18 30	95 00
Point Zapolitan	18 34	94 46
Point St. John	18 20	94 35
Barilla	18 10	94 30
Bar Guazacoalcos	18 11	94 17
River Tonelado	18 11	94 02
River St. Ann	18 12	93 49
River Cupilco	18 26	93 22
Dos Bocas	18 26	93 06
River Chittepeque	18 27	93 00
River Tabasco	18 34	92 37
River St. Peter and Paul	18 40	92 25
Island Carmen, Wt. P.	18 40	91 52
Yucatan.		
Point Escondido	18 56	91 12
Tavinal	19 12	91 00
Point Morros	19 45	90 43
CAMPECHE	19 51	90 33
Point Desconocida	20 46	90 30
Point Gorda	21 06	90 19
Point Piedras	21 09	90 13
Igil	21 20	89 19
St. Clara	21 22	88 45
Bocas de Silan	21 26	88 23
El Cuyo	21 30	87 43
Island Jolvas, N. P.	21 30	87 11
Island Contoy, N. P.	21 36	86 52
The Arcas Islands	20 13.3	92 07.5
Bank Obispo	20 30	92 07
Triangles Islands	20 55	92 10
New Shoal	20 53	91 50
Island Arenas	22 07	91 25
Bermeja, ?	22 33	91 22
Sisal	21 21	90 13
Alacranes	22 32.3	89 43
N. part of Bank off this coast	23 43	88 43
N. E. do	23 27	86 37
I. de Mugeres or Women's I.,	21 18	86 42
I. Cawkun, S. P.	20 42	86 58
New River	20 26	87 15
River Bacales	20 05	87 34
Bay Ascension, entrance	19 26	88 03
Island Cosumel, N. E. P.	20 36	86 45
——— S. W. P.	20 10	87 00
Honduras.		
Pt. Tanack	18 54	87 42
N. Triangle, N. Key	18 44	87 15
Sandy Key, S. P.	18 22	87 18
S. P. Ambergris Key I.	17 52	88 01
BALIZE	17 29	88 12
Turneff Reef, N. Pt.	17 39	87 41
——— S. Pt.	17 10	87 56
English Key	17 19	88 02
Half Moon Key lighthouse	17 13	87 34
Hat Key	17 10	87 41
Tobacco Key I.	16 57	88 04
Santanilla or Swan I	17 23	83 51
Glover's Reef, N. P	16 55	87 40
——— S. P.	16 41	87 48
Renegado Key	16 20	88 11
Sapotilla's Keys, S. E. P.	16 10	88 14
Rattan I., E. P.	16 23	86 15
——— W. P.	16 16	86 51
Guanaja, or Bonacca I., S. P.	16 24	86 00
Cape Three Points	15 59	88 34
Omoa	15 47	88 01

	Lat. D.	Lat. M.	Long. D.	Long. M.
Point Sal	15	53 N	87	48 W
Triunfo de la Cruz	15	55	87	38
Silla, N. P.	16	06	87	02
Truxillo	15	54	86	02
Cape Delegado, or Honduras	16	00	86	06
Cape Cameron	16	02	85	14
Cape False	15	14	83	21
Cape Gracios à Dios	15	00	83	12
Mosquito Shore.				
Caxonnes, W. P.	16	07	83	18
——— S. E. P.	16	02	83	08
Alagarte Aila, N. W. P.	15	09	82	27
Serranilla, N. E. Breaker	15	45	79	41
Serranilla, W. Breaker	15	41	79	58
Sarranna, N. P.	14	29	80	16
Sarranna, S. P.	14	15	80	23
Musketeers, centre	13	31	80	03
Providence I., N. P.	13	23	81	20
Bracman's Bluff	14	02	83	20
Little Corn Island	12	14	82	58
Great Corn Island	12	09	83	03
I. St. Andrew, middle	12	33	81	43
E. S. E. Keys	12	24	81	28
S. S. W. Key or Albuquerque	12	08	81	52
River St. John, S. P.	10	57	83	37
Port Boco Toro	9	25	82	12
Darien.				
I. Escudo, N. P.	9	14	80	57
River Chagre, entrance	9	19	79	59
PORTO BELLO	9	34	79	40
Point Manzanillo	9	33½	79	32
Point St. Blas	9	35	79	03
Point Moschitos	9	08	77	58
Isle of Pines	9	01	77	50
Cape Tiburon	8	41	77	27
Cartagena.				
Point Caribana	8	38	76	58
Point Arboletes	8	55	76	30
Island Fuerte	9	24	76	16
I. S. Barnard, N. W. P.	9	49	75	56
CARTAGENA	10	26	75	38
Punta de la Galera de Samba	10	47	75	30
West ent. River Magdalen	11	05	74	56
St. Martha.				
St. Martha	11	15	74	18
Cape Ajuga	11	20	74	16
Bank Navio quebrador	11	26	73	15
Hacha	11	33	72	59
Cape La Vela	12	11	72	16
Point Gallinas	12	25	71	44
Monges Islands, N. P.	12	28	71	03
Cape Chichibacoa	12	15	71	20
Point Espada	12	04	71	13
St. Carlos	10	57	71	44
Maracaybo.				
MARACAYBO	10	39	71	45
Cora	11	24	69	50
Point Cardon	11	36	70	23
Point Macolla	12	04	70	22
Cape St. Roman	12	11	70	09
Island Oruba, N. W. P.	12	36	70	12
——— S. E. P.	12	24	70	01
Point Auricula	11	56	69	56
Venezuela.				
Point Zamuro	11	26	68	59
Point Soldado	11	14 N	68	40 W
Key Borracho	10	57	68	22
Point Tucatas	10	51	68	21
PORTO CABELLO	10	28	68	07
Point St. John Andres	10	30	67	50
Point Oricaro	10	34	67	18
Point Trinchera	10	37	67	08
LAGUIRA	10	36	67	02
CARRACAS	10	30	67	01½
Centinella I., or White Rock	10	50	66	15
Cape Codera	10	36	66	12
Curacoa I., N. P.	12	24	69	17
——— S. E. P.	12	02	68	49
Little Curacoa	11	59	68	45
Buenayre, N. P.	12	19	68	31
——— S. P.	12	02½	68	22
Birds or Aves I. Western	12	00	67	46
——— Eastern	11	57	67	32
Los Roques, W. P.	11	50	67	01
——— S. E. P.	11	47	66	38
Orchilla I., mid	11	48	66	13
Blanca I., mid	11	51	64	41
E. Point Tortuga I.	10	55	65	18
Seven Brothers, mid	11	47½	64	31
Margarita, W. P.	10	59	64	30
——— E. P.	10	59	63	52
I. Cuagua or Pearl I.	10	49	64	18
Friars I.	11	11	63	49
I. Sola	11	20	63	40
Testigos I.	11	23	63	13
Morro de Unare	10	06	65	22
New Barcelona	10	10	64	48
I. Borracho	10	19	64	51
Cumana.				
Cumana	10	28	64	16
Pta. de Araya	10	38	64	30
Morro Chocopata	10	42	63	54
Escondido or Hidden Port	10	40	63	29
Cape Malapasqua	10	42	63	07
Cape Three Points	10	45	62	46
Point Galera	10	43	62	34
Point Pena or Salina	10	43	61	56
Dragon's Mouth	10	43	61	51
River Gaurapiche, entrance	10	12	62	43
Point Redondo	9	50	61	43
Mouth of Oronoco River	8	50	60	00
Cape Nassau	7	32	58	40
Guayana.				
Essequebo River	7	02	58	26
DEMERARA, lighthouse	6	49	58	11½
River Berbice, entrance	6	23	57	11
Surinam River, entrance	5	57	55	03
Paramaribo	5	48	55	00
R. Marouri, entrance	5	53	53	49
CAYENNE	4	56	52	13
Mouth of Oyapock River	4	14	51	26
Cape Orange	4	14	51	11
R. Cassipour, entrance	3	50	51	00
Cape North	1	49	50	06
Maranham.				
Northern mouth of River Amazon	1	10 N	50	00
Southern do	0	05 S	49	45
Cape Magoany	0	12	48	29
Point Tagioca	0	32	47	58
Para	1	28	48	29
Bay Maracuno	0	33	47	41
Caite Harbor	0	46	47	06

	Lat. D. M.	Long. D. M.
Cape Gurapi	0 39 s	45 56 w
Shoal off do	0 36	45 56
E. Point of Island of St. Joao	1 19	44 50
Vigia, fell in with by M. du Sylvia, officer of the Brazilian Marine, in 1824 or 1825	0 32	44 17
Vigia of Manuel-Luis, Westerly Rock	0 51	44 15
Mondrain Itacolomi	2 09	44 25
Mt. Allegre (the summit)	2 17	44 20
Alcantara (west church)	2 24	44 23
Rock E. of Isle Medo	2 30	44 19
City of San Luis de Maranham (cathedral)	2 31	44 16
Fort Sant Antonio das Areias, the flag staff	2 29	44 17
Fort San Marcos	2 28	44 16
Isle Maranham, (white sand hills, north part)	2 25	44 04
Breakers of Coroa Grande, the north one	2 10	43 58
Northwest one	2 13	44 04
West	2 17	44 05
Isle St. Anne, N. E. point	2 15	43 38
Breakers of Isle St. Anne, E. point	2 13	43 30
Morro Alegre	2 20	43 13
Lancoes Grande, E. point	2 26	43 00
River Perguicas, E. point	2 41	42 27
River Tutoya, entrance	2 41	42 12
River Tapuyu, entrance	2 50	40 50
Mt. Tapuyu, W. summit	2 58	40 51
Mt. Ticondiba, summit	3 11	40 37
Point de Jericacoara, the highest sand hill	2 47	40 27
Sand Hill, near the shore	2 50	40 39
Mount Memoca	3 18	40 06
Fernando Noronha	3 55	32 24
Roccas, (dangerous)	3 55	33 10
Pernambuquinho	3 02	39 37
Morro Melancia	3 12	39 20
Sand hill of Parati	3 24	38 59
Mountains of Ciara, 1st	3 58	38 41
2d. summit	3 53	38 46
3d. do	3 50	38 43
4th. do	3 46	38 49
5th. do	3 39	38 48
Ciara, steeple in the city	3 43	38 34
Point Macoripe	3 42	38 31
Morro Aracati, summit	4 42	39 55
Point Reteiro Grande	4 36	37 33
Reteiro Pequeno, remarkable sand hill	4 48	37 19
Morro Tibao	4 49	37 18
Point de Mel	4 55	36 59
Point du Tubarro	5 02	36 28
(Breaker) das Urcas	4 52	36 19
(Do.) de la Lavandela	4 55	36 20
Point Calcanhar, summit	5 08	35 31
Point Petetinga, low	5 22	35 20
Brazil.		
Cape St. Roque	5 28	35 17
Fort of Rio Grande	5 45	35 15
Point Negra, Mountain	5 53	35 12
Point Pipa, sand mount	6 13	35 04
Bahia Fermosa, S. point	6 23	35 00
Bahia da Traicao, N. point	6 41	34 57
Church of St. Theresa	6 57	34 53
Fort Cabedello	6 58	34 50
Paranahyba de Norte	7 06	34 53

	Lat. D. M.	Long. D. M.
Cape Blanco, steep part	7 08 s	34 48 w
Point de Guya	7 26	34 47
Point das Pedras	7 35	34 48
Village of Pilar	7 36	34 48
Fort, entrance of Rio Ay	7 47	34 51
Nossa Senhora Farinha	7 57	34 51
Olindo, west tower	8 01	34 51
Tower de Recife, Pernambuco	8 04	34 53
Nossa Senhora de Rosario	8 09	34 56
Cape St. Augustin	8 21	34 57
River Ipojuca, entrance	8 23	34 58
Mount Sellada, S. peak	8 25	35 11
Islands of St. Alexio	8 36	35 01
Fort de Tamandare	8 43	35 05
San Bento	9 05	35 17
Village of Quinta	9 16	35 22
La Forquilla, bill	9 10	35 48
Frenchmen's port	9 40	35 41
Village at the point of River Alagoas	9 40	35 47
Morro Sant Antonio	9 22	35 35
River San Francisco	10 29	36 23
Tabayana Mountain summit	10 47	37 23
Rio Vasa Barris	11 11	37 17
Rio Real, S. point	11 28	37 20
Torre de Garcia de Avila	12 32	38 01
River Jacuipe	12 42	38 07
Rock of Itapuan	12 58	38 22
Itapuanzinko, the point	13 01	38 28
St. Antonio, N. W. tower	13 00	38 32
Point Caso Pregos, Isle Itaporica	13 08	38 46
Point Aratuba do	13 05	38 44
Point Iaburn do	12 57	38 36
Mount Conceicao do	13 03	38 41
Morro Sant Amarro do	13 01	38 45
Morro de San Paulo	13 22	38 54
Isle Boypeda	13 38	38 57
Isle Quiepi	13 51	38 57
Point of Muta	13 53	38 57
Villa of Contas	14 18	39 00
Os Ilheos, the largest rock	14 47	38 59
Villa de San George dos Ilheos	14 49	39 00
Rio Cachoeira, S. point	14 49	38 59
Villa of Unha	14 59	38 58
Morro de Commandatuba, S. E. summit	15 22	39 08
Vill. of Commandatuba	15 25	38 56
Village of Belmont	15 51	38 54
Santa Cruz, steeple	16 19	39 02
Porto Seguro, steeple of the Cathedral	16 27	39 03
Isolated Mount	16 52	39 31
Mount Pascal, summit	16 54	39 25
Mount Joao de Siam	17 00	39 37
River Cramimuam	16 51	39 09
Columbiana	17 06	39 12
Villa Prado, Fort	17 21	39 12
Abrolhos Islands; the largest island	17 58	38 42
Rio de San Matheo	18 37	39 45
Rio Doce, entrance	19 37	39 51
Serra dos Reis Magos, the S. summit	19 50	40 22
Morro Almeyda	19 57	40 20
Mestre Alvaro, summit	20 09	40 22
Cape Zubarro	20 16	40 17
"Pitou" at the north of the city of Victoria	20 18	40 23
Nossa Senhora de Penha, the church	20 20	40 20

	Lat. D.	Lat. M.	Long. D.	Long. M.
Mount Morena	20	19 s	40	19 w
Pacotes rocks	20	21	40	17
Point Jicu	20	26	40	22
Martin Vas Rock	20	29	28	54
Trinidad Island	20	31	29	21
Guarapari	20	44	40	33
Morro Bo, (isolated mount'n,)	20	48	40	41
Morro de Benevento	20	55	40	49
Serra de Guarapari	20	50	41	08
Mt. de Campos, S. summit	21	23	41	28
Mtns. of Furado, highest	21	50	41	43
Cape St. Thomas	22	03	41	00
Isle St. Ann, the largest	22	25	41	46
Pic do Frade de Macahe	22	12	42	09
Morro San Joao, summit	22	32	42	06
Cape Buzios, S. point	22	46	41	56
Isles Ancora, easternmost	22	46	41	51
Cape Frio, S. point	23	01	41	59
Cape Negro	22	57	42	35
Isles Maricas, southernmost	23	01	42	51
Redondo	23	04	43	09
Rio Janeiro, sugar loaf	22	56	43	09
La Gabia	22	59	43	23
Isle Georgi Grego	23	15	44	19
O. Pakagaio, top of I. Grande,	23	11	44	21
Ilha Grande, Pt. Acaya	23	15	44	29
Point Ioatinya	23	18	44	39
Pic de Parati, summit	23	19	44	54
Isles Couves, largest	23	26	44	58
Isle Victoria	23	48	45	14
Isle Buzios, S. E.	23	44	45	06
Isles dos Porcos, south sand hill	23	34	45	10
Isle St. Sebastian				
" Highest mountain	23	48	45	22
" Point Pirassonungo	23	58	45	20
Alcatrasses	24	06	45	47
Mouton de Trigo	23	51	45	52
Lage de Santos	24	18	46	18
Isle of Santos	24	04	46	13
Point Grossa	23	59	46	24
" Taypu	24	01	46	30
Isle Queimada Grande	24	28	46	47
Isle Queimada Pequena	24	21	46	54
Point Jurea	24	33	47	19
Mount Cardoz	24	59	48	12
Isle Bom Abrigo	25	07	47	58
Rocher Castello	25	16	48	03
Rocher Figo	25	22	48	10
Isle de Mel, south top	25	33	48	26
Roc Coral	25	46	48	30
Roc Itascolomi	25	50	48	33
Point Joao Diaz	26	07	48	40
Isles Tamboretes	26	21	48	39
Isles Remedios	26	29	48	42
Point Itapacoroya	26	47	48	44
Isle Avoredo, top	27	17	48	29
Isle St. Catharine, E. point	27	26	48	29
do. Point Rapa	27	23	48	32
do. Steeple of Nossa Senhora do Desterro	27	36	48	40
Point Viraquera	28	13	48	39
Isle das Araras	28	18	48	37
Point Bituba	28	16	48	39
Isle de Lobos de la Laguna	28	24	48	45
Morro da Barra	28	29	48	50
The City de la Laguna	28	28	48	51
Cape St. Marta Pequeno	28	39	48	51
" St. Marta Grande	28	39	48	50
Barra Velha	28	51	49	16
As Torres	29	28	50	00
Beach of Fernambuco, east part	29	52 s	49	59 w
Beach do Destretto, E. part	31	12	50	40
Rio Grande de San Pedro	32	07	52	09
Bank of Sand and Shells, E. part	33	44	52	31
Los Castillos, the eastern rock,	34	24	52	41
Rio de la Plata.				
Cape de Rocha, or St. Maria	34	39	54	10
Isle do Lobos, the middle	35	01	54	54
City of Maldonado, the tower,	34	53	55	00
Isle de Goriti, English Tomb	34	55	55	00
Whale Point	34	54	55	04
Black Point	34	53	55	17
Point d'Afilar	34	47	55	31
" das Piedras Negras de Saint Rosa	34	46	55	44
Isle de Flores, the Tower	34	56	55	57
Monte Video, the Cathedral	34	54	56	13
Isle Ratos of Monte Video	34	52	56	15
Cerro de Monte Video	34	53	56	17
Point de l'Espinillo	34	50	56	26
La Panella	34	55	56	26
Point du Sauce	34	25	57	27
The Colony of San Sacramento	34	28	57	51
Cape St. Antoine	36	20	56	47
Le Salado, the entrance	35	44	57	25
Hill of Juan Jeronimo	35	29	57	21
Point de Piedras de St. Borombon	35	28	57	09
Hill Salvador Grande	35	19	57	10
Point de l'Indio	35	15	57	12
First Ombu tree of the Magdalena	35	03	57	10
La Magdelena, the Church	35	02	57	34
Point de la Atalaya	34	55	57	44
" de Santiago	34	50	57	55
Point de Lara	34	47	58	02
Buenos Ayres, Florida street, No. 87	34	36	58	24
Cape Lobos	36	55	56	47
Rio de la Plata to Cape Horn.				
Cape Corientes	37	59	57	39
Point de Neuva	42	55	64	09
St. Elena	44	31	65	17
Cape Blanco	47	12	65	43
Point Desire	47	45	65	52
Port St. Julien, Cape Curioso,	49	11	67	35
St. Cruz Harbor	50	09	68	19
Cape Fairweather	51	32	68	55
Cape Virgins, northern point of entrance to Magellan's Straits	52	19	68	17
Cape Espirito Santo, summit 5 miles inland	52	42	68	41
Terra del Fuego, C. Penas	53	45	67	29
——— Cape St. Diego	54	41	65	02
Staten Land				
——— Cape St. John, easternmost land near Cape Horn	54	48	63	42
——— C. St. Bartholomew	54	57	64	39
——— C. del Medio, entrance to Le Maire's Straits	54	49	64	48
New Island E. part	55	17	66	25
Evout's Island, middle	55	33	66	40
Barnevelt Islands, E. point	55	49	66	40
Cape Horn, summit	55	59	67	11

	Lat. D.	Lat. M.	Long. D.	Long. M.		Lat. D.	Lat. M.	Long. D.	Long. M.
I. Diego Ramires, S. part	56	27 s	68	36 w	Cape Bougainville	51	18 s	58	28 w
——— N. part	56	22	68	37	Cape Carysfort	51	26	57	50
					Berkely Sound, (Eagle Point)	51	34	57	46
Terra del Fuego.					Cape Pembroke	51	42	57	42
——— Yorkminster	55	24	70	02	Sea Lion Islands, easternmost point	52	27	58	54
——— C. Gloucester	54	30	73	02	Beauchêne Island	52	51	59	12
——— Cape Pillars, S. W. entrance to Magellan's straits,	52	43	74	38	Cape Meredith, S. W. point Falkland Islands	52	16	60	39
Evangelist I., W. entrance to Magellan's straits	52	24	75	03	Cape Split	51	49	61	20
					Jason Islands, (West Key)	51	00	61	27
Falkland Islands.									
Eddystone Rock, (20 feet)	51	10	59	03					

The Latitudes and Longitudes in the preceding Table have been selected from the most recent and best authorities.

Those of the Coast of Newfoundland and Gulf of St. Lawrence have been altered to correspond with the recent observations, as far as received, of the officers under the direction of Sir Charles Ogle, and those made by Captain Bayfield, R. N., who is surveying the St. Lawrence.

The positions of the principal points of the Coast of the United States are altered to agree with the observations made of the Eclipse of the Sun of February 12 h, 1831.

The Balize from a number of occultations by Captain A. Talcott, United States Commissioner for the Northeastern Boundary; and the Sabine by Major J. D. Graham, U. S. T. E., one of the Commissioners for determining the United States Southwestern Boundary, and now a Commissioner on the Northeastern Boundary Line.

In the above cases it will be seen that both points have been placed too far to the westward in all previous publications.

The West Indies are adapted to the most recent observations; among others, to those of Commander R. Owen, and E. Barnett, R. N.

The Coast of South America, from St. Luis, Maranham, to St. Catharine's, from the observations of Baron Roussin, with the exception of Rio Janeiro, which is that of Capt. R. Fitzroy, R. N.; from St. Catharine's to the River Plate, by M. Barral; and from Port St. Elena to Cape Horn, by Captains P. P. King, and R. Fitzroy, R. N.

NOTE.—It may have been remarked, that in the three previous editions of this work, no credit was given to the United States Navy Department, among the authorities, for any information that they might have possessed; the reason was, that they would not permit such information to be disseminated.

We now are bound to say that there has been an entire change in that particular, under the direction of the Hon. A. P. Upshur, the present Secretary of the Navy.

E. & G. W. BLUNT.

APPENDIX

MAY, 1843.

BOON ISLAND LEDGE, (p. 150,) is about 200 feet long, and about the same in width; is bare at low tides, and may be seen breaking at all times in a heavy ground swell.

The Ledge bears from the island E. ¼ S., two and three quarters of a mile distant. There is a passage between the Ledge and the island, but it will not do for strangers, as there is a reef extends three quarters of a mile from the S. E. point of the island.

YORK LEDGE, (p. 151.)—This rock is bare at three-quarters tide, extending E. N. E. and W. S. W., about 400 feet. It is about 300 feet wide.

N. E. from the main rock there is a shoal runs off a quarter of a mile, having upon it only two fathoms at low water.

The soundings are gradual, from five to twenty fathoms half a mile from the rock.

BEACON.—An iron beacon has been placed upon this rock; it is 33½ feet high, and about 25 feet above the level of the water.

Upon the pillars rests an iron tabular column, supporting an iron base of 3½ feet diameter, upon which is inscribed "York Ledge. 1841."

The Triangles, which break in a heavy sea, and which have four fathoms at low water, bear S. W., two miles distant from this beacon.

Boon Island light bears from this beacon E. ¾ N. 5½ miles; Whale's Back light, W. by S. ¼ S., 5 miles; White Island light, S. by W. ¾ W., 8½ miles; York Nubble, N. by E., 4½ miles.

COHASSET ROCKS, or Minot's Ledge, (p. 167,) is situated in Boston Bay, eight miles S. E. ½ E. from Boston light, and six miles N. ½ W. from Scituate light, and consists of 15 large rocks out of water, and ledges all round these rocks. The nearest land is Scituate, 3 miles distant. These rocks extend north and south from 3½ to 4 miles. Small vessels pass between the rocks. The depth of water round the rocks is 5 and 6 fathoms.

LEDGE OFF SANDY HOOK, (p. 205.)—On this reef there are but 9 feet water. The Northern light on the Highlands a little open to the eastward leads right on this reef.

BEACON ON ROMER, (pages 205 to 208.)—A granite beacon, 25 feet high, has been placed on the North-western point of Romer, 9 feet above water.

It bears from the light on Sandy Hook N. 10° W.; from the light at the Narrows S. 15° E.

This beacon was intended to mark out the Swash Channel. It is on the wrong end of the shoal.

Vessels bound in will infallibly get on shore if they run for it.

CAPE MAY, (p. 210.)—S. E., 1½ mile from Congress Hall, there is a shoal, one mile in extent, on which there are only 6 feet water. There are 4 fathoms inside of it. It is called Uncle Eph.

A new channel of 17 feet water, in a W. S. W. direction from Cape May light, has been discovered by Capt. Gedney, in the U. S. Surveying Brig Washington. When it is buoyed off we will give directions for it.

CAPE HENLOPEN, (p. 210.)—The beacon in range with the light on the breakwater leads you on the edge of the Hen and Chickens.

MARTIN'S INDUSTRY, (p. 231.)—There is a light ship showing one light 22 feet above the surface, anchored in 6½ fathoms water, off Martin's Industry, on the following bearings, viz:

N. point Trench's Island, N. W. ½ N.
Bay Point, N. W. by N.
Tybee Light, W. S. W., about 18 miles.

BAHAMA BANKS.—Since the publication of the directions from pages 226 to 245, we have published the surveys of Com. E. Barnett, R. N. From his surveys, it appears the best courses over the Bank are,

When Stirrup Key bears S. 2½ to 3 miles, steer W. S. W. 28 miles. You are then on the centre of the Bank, in the best water—say 2 fathoms, at low water. You then steer S. W. by S. 76 or 77 miles, which carries you off the Bank to the northward of the shoal grounds.

In all cases, run off the Bank to the Northward of 24° 32′, as the shoal grounds begin there.

CARYSFORT REEF, (pages 236 and 250.)—This dangerous reef has been surveyed, and the position of the light-ship determined. It is moored inside the reef, in lat. 25° 12′, long. 80° 16′ 20″.

We advise shipmasters not to place much reliance on this, or any of the Florida lights, as they are all bad.

CAPE FLORIDA LIGHT, (Key Biscayno, page 251.)—This lighthouse has not been rebuilt, nor do we know if it ever will be. [Reason—afraid of the Florida Indians.]

ST. JOSEPH'S, (page 258.)—A new passage into St. Joseph's has been laid out by Lieut. C. Powell, U. S. brig Consort. The entrance is 2¼ miles W. N. W. from the lighthouse. Bring two pine trees, on the eastern side of the bay, painted white, in range, (they then will bear N. E. by N.,) and run for them: keep on this course until you get the eastern shore aboard, when you may shape your course for the town, keeping the eastern shore aboard, until you get to the southward of the lighthouse.

HORN ISLAND, (p. 260.)—There is no lighthouse on this island.

BELLE ISLE, (p. 266.)—On the Western end of this island there is a revolving light, showing the entrance to Vermilion Bay.

PASS CABELLO, (page 268.)—A buoy has been moored at the entrance of this Pass.

Vessels bound in, should leave the buoy to the eastward, at a distance of from fifteen to eighty yards.

Eleven feet can be carried in at the top of high water, and plenty of room inside, with good anchorage, in four fathoms.

GREAT HENEAGUA, (p. 303).—On the night of March 27, 1842, the steamer Clarion, B. Williams, master, drawing 10½ feet water, struck on a shoal and knocked off part of her false keel. Capt. W. supposed that he was about 15 miles off from the S. W. point of the Island, in a S. W. direction.

COCKBURN HARBOR—East Caycos—(page 308.)—Entrance in lat. 21° 29′ N., long 71° 27′ 30″ W.

High water at 7 o'clock, at full and change; tide rises 3 feet; depth of water, about 14 feet, at low water.

The harbor is one mile in depth. The course in is N. W., when the harbor is open.

ST. JAGO DE CUBA, (p. 327.)—A revolving light has been placed on the Morro Castle, on the eastern side of the entrance.

PUERTO PLATT, (page 354.)—In running in, keep midway between the points; and as soon as round the point, let go your anchor in 3½ fathoms.

There are not now any mangrove bushes.

MORANT POINT, (p. 368.)—On this point there has been a cast iron lighthouse erected; it is to contain a revolving light: times of light and darkness equal. It will be lighted about the 1st of January, 1842.

CAYMAN BANK, (p. 382.)—A bank was discovered in July, 1839, having on it from 17 to 15 fathoms water.

It is about 4½ miles long, in an E. N. E. and W. S. W. direction, and from a mile to 1½ mile in width.

The north-eastern end is in long. 81° 32′ W., lat. 19° 20′ N.: the south-western point, long. 81° 36′ W., lat. 19° 18′ N.

MARANHAM LIGHT, (page 517.)—A light is erected on Mount Itacolami, on the western side of the Bay of Maranham.

The lighthouse is a four square building, its four sides bearing on the four cardinal points of the compass; is 75 feet high from its base, and 147 feet from high water mark, at the spring tides. It is a revolving light of two distinct colors, one natural and the other of a reddish color, visible and invisible, about two minutes each revolution, and lies in latitude 3° 09′ N., longitude 42° 24′ W. of Greenwich.

RIO GRANDE DE SAN PEDRO, (p. 545.)—A light house containing a fixed light 64 feet above the sea, has been erected at this place.

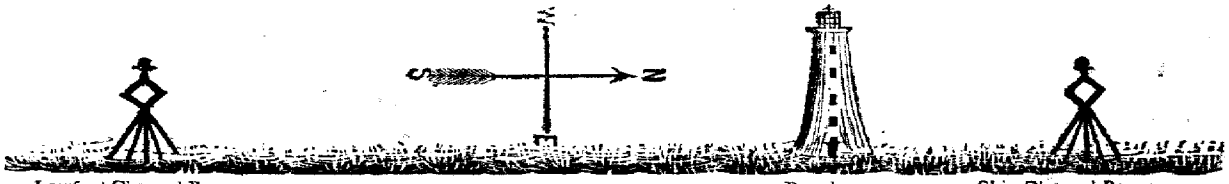
POINT JESUS MARIA, (p. 552.)—S. E., *true*, from Point Jesus Maria, and S. W., *true*, from St. Gregory and Santa Lucia, is a shoal of light colored quicksand, having on it twelve feet, on which the U. S. Frigate Potomac struck, in December, 1840.

ADDITIONAL APPENDIX.

FEBRUARY, 1844.

CAPE BONAVISTA, Newfoundland, (p. 22.)—On this cape there is a revolving light of two minutes interval, showing alternately a red and white light, at an elevation of 150 feet above the sea.

SANDY HOOK LIGHT SHIP, (p. 205.)—This ship has been removed; she is now moored E. by S. 5¾ miles from Sandy Hook Lighthouse, in 15 fathoms water. We do not think that shipmasters should rely upon finding this vessel, as, like most of our light ships, when much wanted, not to be found.



Lawford Channel Beacon. Revolving. Ship Channel Beacon. Fixed Light.

CHARLESTON, S. C. (p. 228.)—SHIP CHANNEL. Standing in for the Bar, bring the Beacon to appear as above, a handspike's length to the N. of the Lighthouse, and you will soon make the Bar Buoy lying in 3 fathoms water, and which may be passed on either side. Nearly in the same range lie two other buoys,—the first on the South point of the North Breaker, and the other on the inner South point (or S. W. point) of the same breaker. These buoys are to be left on the starboard hand, at the distance of a ship's length. After passing the inner Buoy, steer N. or N. ½ W. (according as the tide is flood or ebb) for Sullivan's Island,—on which is a house standing East and West with white windows, to be brought on with a white beacon when you are in mid-channel. Stand no farther to the Westward than to bring the beacon on with the East side of the Fort; nor to the Eastward, than to bring the beacon on with the Easternmost house on Sullivan's Island. Off Cummin's Point lies a buoy which may be passed within a vessel's length, and must be left on the larboard hand.—From Cummin's Point Buoy the course is N. W. by N. to the anchorage in Rebellion Roads. When mid-way between Sullivan's Island and Cummin's Point Buoy, you will clear the "Middle Ground" by steering for Fort Pinckney, keeping it a little on the larboard bow. Give the island a berth of about 100 yards as you approach it, and anchor off the city.

LAWFORD CHANNEL has one buoy at its entrance, which you will find by keeping the South Beacon open to the Northward of the Lighthouse about three handspikes' lengths. Leave the buoy on the starboard hand at the distance of 50 yards, and then steer N. N. E. to clear shoals on the larboard hand, until the Lighthouse bears W. N. W., when the course should be directed to Sullivan's Island. The South Beacon is not lighted.

On Morris' Island are two white beacons, which, kept in range, will bring you to a buoy lying at the entrance of the *Overall Channel*. Keep the beacons directly on with each other and steer for them until you strike 5 fathoms water, and then shape your course for Sullivan's Island. They are both lighted. At low water 7 feet can be carried through this channel,—at high water, 13.

There are three buoys in the NORTH CHANNEL. Run for the outer buoy, leaving it on the larboard hand,—thence for the middle buoy, which leave on the starboard, and the inner on the larboard hand. Nearly the same water may be found in the North as in the Overall Channel, but the latter is to be preferred.

LOOE KEY BEACON, (p. 250 & 253) is washed away.

TOBAGO, (p. 425).—The shoal is an extremely dangerous one, having only from 17 to 21 feet water upon a considerable portion of it, and lies directly in the channel of vessels going from Tobago to Trinidad, as also of vessels coming from Demerara and rounding the southern extremity of Tobago on their voyage home. The shoalest part lies S. 20 W. from Brow's or Crown Point, distant about two miles and a quarter, and from Point Columbus, Island of Tobago, S. 67 W. distant three miles and a quarter, and upon the ebb tide there is generally a current to 3 miles an hour setting about N. W. by W. probably caused by the outlet of the waters of the River Oronooka.

RIO GRANDE SAN PEDRO, (p. 545.)—A fixed light is placed in the Tower at the entrance.

AUGUST, 1845.

BANKS OF NFWFOUNDLAND, (p. 12, 13.)—A rock of 100 to 200 feet in extent, with 21 feet upon it, in lat. 46° 30′, about 50 miles E. of the Virgin Rocks, making it in long. 49° 45′. It was discovered by Captain Ryder, of Provincetown, who states he afterwards made the Virgin Rocks.

CASHE'S LEDGE, (p. 129.)—Captain Owen, R. N., has searched three times for it, without success, in and near the latitude and longitude laid down. He thinks there is a bank near abouts the place where it is laid down, but is certain it is not in lat. 43° 2′ N. long. 69° 6′ W. [See his track on our Chart N. E. Coast U. States.]

GEORGE'S BANKS, (p. 129 to 131.)—A bank, which is called upon the chart "Clark's Bank," has been discovered inside of George's Shoal. Ten fathoms water have been found upon it, in lat. 41° 34′, long. 69° 15′.

LITTLE GEORGE'S BANK, having only 5 fathoms, and which breaks in heavy weather. It is in lat. 41° 11′, and about long. 68° being about S. W. by S. from the Great Shoal of George's Bank. The fishermen have given it the above name.

COLUMBIA LEDGE, off Mount Desert, (p. 136.)—This ledge has been surveyed by Capt. Owen, R. N. It bears S. W. by S. 3614 feet from Mount Desert, and has upon it only 3 fathoms water. Inside, there are 22 fathoms; outside, close to the rock, there are 17, 18, 20, 25, 30, and 35 fathoms water.

McCRIE'S SHOAL, off Cape May, (p. 210.)—This Shoal bears seven miles South-east from Cape May Lighthouse, and has less than 3 fathoms water upon it. Another Shoal, 15 miles E. S. E. from Cape Henlopen Lighthouse, with 4¼ fathoms water upon it. The above were examined by Lieut. Bache, U. States Coast Survey, in 1844.

CHRONOMETERS.

———ooo———

EDWARD I. DENT, 82 STRAND, LONDON,

(Of the late firm of Arnold & Dent,)

Offers for sale, in the United States, solely through Messrs. E. & G. W. Blunt, of New York, Chronometers made in the best manner by him, and under his immediate superintendance. Every Chronometer made by him will be warranted; and all those sold in the United States by the above named firm will be promptly exchanged if the performance be not satisfactory to the purchaser.

The British Government have, for many years, fostered the manufacture of Chronometers, by annual premiums, given to the makers of superior instruments. Arnold & Dent have received several premiums; and, as an evidence of their skill, the subjoined list is given.

RATES OF CHRONOMETERS....ROYAL OBSERVATORY.

ARNOLD & DENT.—No. 521.

	June.	July.	Aug.	Sept.	Oct.
	"	"	"	"	"
Mean daily variation,.....	5·01	5·18	5·13	5·34	5·34
Extreme variation, ...	1·2	1·1	1·9	1·0	1·05

ARNOLD & DENT.—No. 676.

	July.	Aug.	Sept.	Oct.	Nov.	Dec.
	"	"	"	"	"	"
Mean daily variation, ...	0·00	0·37	0·51	0·53	0·39	0·35
Extreme variation,.....	1.1	1·1	1·2	1·2	1·0	1·0

No. 663, used by captain Fitzroy, of H. M. Surveying Ship Beagle, gave the longitude of Rio within one minute in space of the mean resulting from twenty-two chosen Chronometers embarked in said vessel. And out of eight Chronometers on board H. M. Surveying Ship Blossom, Arnold & Dent's proved the best.

E. I. DENT.—No. 114.

The performance of this Chronometer, made by Mr. Dent, has never been surpassed. It received the first premium.

RATE OF THE ABOVE CHRONOMETER.

	Mean Rate.		Extreme variation between any two days.		Mean Rate.		Extreme variation between any two days.
	s		s		s		s
1828.	Aug.....+3·43	1828.	Aug.....0·7	1829.	Feb.....+3·59	1829.	Feb.....1·1
	Sep. .....+3·85		Sep. .....1·7		March. .+3·74		March. .1·6
	Oct. .....+3·73		Oct. .....0·8		April. ...+3·60		April. ...1·1
	Nov.....+3·87		Nov.....0·9		May. ....+3·58		May. ....1·2
	Dec.....+3·93		Dec.....1·2		June. ....+3·77		June. ....0·8
1829.	Jan. .....+3·59	1829.	Jan. .....1·4		July. ....+3·97		July. ....1·6

	s
Greater Rate in July.....	3·97
Lesser Rate in August ...	3·43
Actual variation in the year	0·54 hundredths of a second.

This is superior to any other yet tried by order of the Lords of the Admiralty during the whole period of their public trial.—[1840.]

These instruments, though very superior, have been equalled by others of the same manufacture, and the same care will be continued in the work-shops of the subscriber to turn out the best instruments.

All Masters of vessels, and others in the United States, having in their possession Chronometers made by E. I. Dent, or Arnold & Dent, which need cleaning or repairing, are requested to send them to E. & G. W. Blunt, who are provided with an excellent workman, sent out by the subscriber.

June 15, 1841. E. I. DENT, 82 Strand, London.

E. & G. W. Blunt, No. 179 Water street, corner of Burling Slip, New York, request the attention of Ship Masters and others, wanting good Chronometers, to the preceding advertisement of Mr. Dent's. They have an Observatory at Brooklyn, furnished with an excellent Transit and Astronomical Clock, and at their store, two other Astronomical Clocks, by which they are enabled to determine the rates of Chronometers with accuracy. All repairs of Chronometers made by them will be warranted.

Ship Masters are requested, immediately on their arrival, to send their Chronometers to the store of the subscribers to be rated, or to give notice where they may be sent for. *The Harbor Master's books are kept at their store*, where applications for berths for vessels must be made; and where directions may be left respecting their Chronometers.

FRANCIS' PATENT LIFE BOATS.

Among the recent improvements designed for the benefit of the marine community, the one above named occupies a conspicuous and well deserved place.

The Association which has been formed in the city of New York, for the purpose of building these boats, have published a pamphlet of 48 pages, containing the most ample testimonials of their great utility, and of the necessity which exists that every vessel should be provided with them.

Among the testimonials is the report of the first Lieutenant of the French Frigate Veloce, a number of our Packet Masters, Captain R. Gedney, U. S. Navy; Captain Sturgis, of the U. S. Revenue Cutter; Captain Green Walden, U. S. Revenue Cutter; Commodore E. M. Moore, Texian Navy; Commodore De Kay, Chamber of Commerce of New York, which we annex; the American Institute, and a committee of officers of the U. S. Navy.

FROM THE COURIER AND ENQUIRER.

Chamber of Commerce, March 2d, 1841.

The following Report was received and approved, and ordered to be entered on the Minutes:

The Committee of the Chamber of Commerce, to whom was referred the Memorial of Joseph Francis & Co., asking for an examination into the merits of their new improvement in boats, called "The Great American Life Boat," respectfully Report:—

That they have examined original documents, containing highly satisfactory testimonials of the opinions entertained of these Life Boats, after having been submitted to the test of experiment; and have also made diligent inquiry of the Shipmasters who have been enabled, from practical experience, to judge of the nature of this improvement. Your Committee accordingly beg leave to recommend the adoption of the following resolutions:

Resolved, That the Chamber of Commerce of New York, convinced of the great importance and practical utility of "Francis' Improved American Life Boat," as an essential, if not indispensable auxiliary to our mercantile marine, cheerfully recommend the employment of these boats to all parties concerned in the navigation of this port.

Resolved, That a copy of this Report be sent to Messrs. Francis & Co., the authors of this improvement, with the thanks of the Chamber for their successful efforts, in aid, not only of the shipping interest in general, but of the cause of humanity.

Respectfully submitted,

(Signed) JA'S D. P. OGDEN, Chairman.

Messrs. JOSEPH FRANCIS & Co.

Gentlemen—I have great pleasure in transmitting to you the annexed Extract of the Minutes of the Chamber of Commerce of the 2d inst.,

And remain, respectfully, your obed't serv't,

EDW'D A. B. GRAVES, Secretary.

New York, March, 1841.

Boats of all sizes and capacities, can be furnished at short notice; by applying at the office of the Association, 64 Liberty street, New York.